

Facility:		SONGS 2 & 3		Date of Exam:		10/23/2006											
Tier	Group	RO K/A Category Points											SRO-Only Points				
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	Total	A2	G*	Total	
1. Emergency & Abnormal Plant Evolutions	1	3	1	3				4	4			3	18	3	3	6	
	2	0	1	3				2	1			2	9	2	2	4	
	Tier Totals	3	2	6				6	5			5	27	5	5	10	
2. Plant Systems	1	3	4	1	4	1	1	6	2	1	2	3	28	3	2	5	
	2	1	0	1	1	2	2	0	1	2	0	0	10	0	2	3	
	Tier Totals	4	4	2	5	3	3	6	3	3	2	3	38	5	3	8	
3. Generic Knowledge and Abilities Categories				1	2	3	4	10	1	2	3	4	7	2	1	2	2
Note:	1.	Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outlines (i.e., except for one category in Tier 3 of the SRO-only outline, the "Tier Totals" in each K/A category shall not be less than two).															
	2.	The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ±1 from that specified in the table based on NRC revisions. The final RO exam must total 75 points and the SRO-only exam must total 25 points.															
	3.	Systems/evolutions within each group are identified on the associated outline; systems or evolutions that do not apply at the facility should be deleted and justified; operationally important, site-specific systems that are not included on the outline should be added. Refer to ES-401, Attachment 2, for guidance regarding elimination of inappropriate K/A statements.															
	4.	Select topics from as many systems and evolutions as possible; sample every system or evolution in the group before selecting a second topic for any system or evolution.															
	5.	Absent a plant specific priority, only those KAs having an importance rating (IR) of 2.5 or higher shall be selected. Use the RO and SRO ratings for the RO and SRO-only portions, respectively.															
	6.	Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.															
	7.*	The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system.															
	8.	On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IR) for the applicable license level, and the point totals (#) for each system and category. Enter the group and tier totals for each category in the table above. Use duplicate pages for RO and SRO-only exams.															
	9.	For Tier 3, select topics from Section 2 of the K/A Catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10CFR55.43															

ES-401	SONGS 2006 NRC Written Examination Outline Emergency and Abnormal Plant Evolutions – Tier 1 Group 1	Form ES-401-2
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E/APE # / Name Safety Function	G	K1	K2	K3	A1	A2	Number	K/A Topic(s)	Imp.	Q#
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022 / Loss of Rx Coolant Makeup / 2						X	AA2.01	Ability to determine and interpret the following as they apply to the Loss of Reactor Coolant Pump Makeup: Whether charging line leak exists	3.8	76
027 / Pressurizer Pressure Control System Malfunction / 3	X						2.1.23	Conduct of Operations: Ability to perform specific system and integrated plant procedures during all modes of plant operation.	4.0	77
055 / Station Blackout / 6						X	EA2.04	Ability to determine or interpret the following as they apply to a Station Blackout: Instruments and controls operable with only dc battery power available	4.1	78
057 / Loss of Vital AC Inst. Bus / 6						X	AA2.06	Ability to determine and interpret the following as they apply to the Loss of Vital AC Instrument Bus: AC instrument bus alarms for the inverter and alternate power source	3.7	79
E02 / Reactor Trip - Stabilization - Recovery / 1	X						2.1.2	Conduct of Operations: Knowledge of operator responsibilities during all modes of plant operation.	4.0	80
E05 / Steam Line Rupture - Excessive Heat Transfer / 4	X						2.4.31	Emergency Procedures / Plan Knowledge of annunciators alarms and indications, and use of the response instructions.	3.4	81
007 / Reactor Trip - Stabilization - Recovery / 1					X		EA1.01	Ability to operate and monitor the following as they apply to a reactor trip: T/G controls	3.7	39
008 / Pressurizer Vapor Space Accident / 3	X						2.1.32	Conduct of Operations: Ability to explain and apply all system limits and precautions.	3.4	40
009 / Small Break LOCA / 3				X			EK3.22	Knowledge of the reasons for the following responses as the apply to the small break LOCA: Maintenance of heat sink	4.4	41
011 / Large Break LOCA / 3		X					EK1.01	Knowledge of the operational implications of the following concepts as they apply to the Large Break LOCA: Natural circulation and cooling, including reflux boiling.	4.1	42
015 / 17 / RCP Malfunctions / 4			X				AK2.08	Knowledge of the interrelations between the Reactor Coolant Pump Malfunctions (Loss of RC Flow) and the following: CCWS	2.6	43
022 / Loss of Rx Coolant Makeup / 2						X	AA2.02	Ability to determine and interpret the following as they apply to the Loss of Reactor Coolant Pump Makeup: Charging pump problems	3.2	44

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E/APE # / Name Safety Function	G	K1	K2	K3	A1	A2	Number	K/A Topic(s)	Imp.	Q#
025 / Loss of RHR System / 4						X	AA2.02	Ability to determine and interpret the following as they apply to the Loss of Residual Heat Removal System: Leakage of reactor coolant from RHR into closed cooling water system or into reactor building atmosphere	3.4	45
026 / Loss of Component Cooling Water / 8						X	AA2.03	Ability to determine and interpret the following as they apply to the Loss of Component Cooling Water: The valve lineups necessary to restart the CCWS while bypassing the portion of the system causing the abnormal condition	2.6	46
038 / Steam Gen. Tube Rupture / 3				X			EK3.06	Knowledge of the reasons for the following responses as they apply to the SGTR: Actions contained in EOP for RCS Water Inventory Balance, SG Tube Rupture, and Plant Shutdown Procedures	4.2	47
029 / ATWS / 1		X					EK1.05	Knowledge of the operational implications of the following concepts as they apply to the ATWS: definition of negative temperature coefficient as applied to large PWR coolant systems.	2.8	48
055 / Station Blackout / 6				X			EK3.01	Knowledge of the reasons for the following responses as the apply to the Station Blackout: Length of time for which battery capacity is designed	2.7	49
056 / Loss of Off-site Power / 6		X					AK1.04	Knowledge of the operational implications of the following concepts as they apply to Loss of Offsite Power: Definition of saturation conditions, implication for the systems	3.1	50
057 / Loss of Vital AC Inst. Bus / 6					X		AA1.06	Ability to operate and / or monitor the following as they apply to the Loss of Vital AC Instrument Bus: Manual control of components for which automatic control is lost	3.5	51
058 / Loss of DC Power / 6					X		AA1.03	Ability to operate and / or monitor the following as they apply to the Loss of DC Power: Vital and battery bus components	3.1	52
062 / Loss of Nuclear Svc. Water / 4	X						2.4.6	Emergency Procedures / Plan Knowledge symptom based EOP mitigation strategies.	3.1	53
065 / Loss of Instrument Air / 8	X						G2.1.2	Conduct of Operations: Knowledge of operator responsibilities during all modes of plant operation	3.0	54
E05 / Steam Line Rupture - Excessive Heat Transfer / 4						X	EA2.1	Ability to determine and interpret the following as they apply to the (Excess Steam Demand) Facility conditions and selection of appropriate procedures during abnormal and emergency operations.	2.7	55

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E/APE # / Name Safety Function	G	K1	K2	K3	A1	A2	Number	K/A Topic(s)	Imp.	Q#
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E06 / Loss of Main Feedwater / 4					X		EA1.2	Ability to operate and / or monitor the following as they apply to the (Loss of Feedwater) Operating behavior characteristics of the facility.	3.4	56
K/A Category Point Totals:	3/3	3	1	3	4	4/3	Group Point Total:			18/6

E/APE # / Name Safety Function	G	K1	K2	K3	A1	A2	Number	K/A Topic(s)	Imp.	Q#
005 / Inoperable/Stuck Control Rod / 1	X						2.1.12	Conduct of Operations: Ability to apply Technical Specifications for a system.	3.8	82
A11 / RCS Overcooling - PTS / 4	X						2.1.2	Conduct of Operations: Knowledge of operator responsibilities during all modes of plant operation.	4.0	83
A13 / Natural Circ. / 4						X	AA2.2	Ability to determine and interpret the following as they apply to the (Natural Circulation Operations) Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.	3.8	84
E09 / Functional Recovery						X	EA2.2	Ability to determine and interpret the following as they apply to the (Functional Recovery) Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.	4.0	85
005 / Inoperable/Stuck Control Rod / 1	X						2.1.23	Conduct of Operations: Ability to perform specific and integrated plant procedures during all modes of plant operation	3.9	57
024 / Emergency Boration / 1				X			AK3.02	Knowledge of the reasons for the following responses as they apply to the Emergency Boration: Actions contained in EOP for emergency boration	4.2	58
028 / Pressurizer Level Malfunction / 2	X						2.1.27	Conduct of Operations: Knowledge of system purpose and or function.	2.8	59
032 / Loss of Source Range NI / 7				X			AK3.01	Knowledge of the reasons for the following responses as they apply to the Loss of Source Range Nuclear Instrumentation: Startup termination on source-range loss	3.2	60
037 / Steam Generator Tube Leak / 3				X			AK3.07	Knowledge of the reasons for the following responses as they apply to the Steam Generator Tube Leak: Actions contained in EOP for S/G tube leak	4.2	61
051 / Loss of Condenser Vacuum / 4					X		AA1.04	Ability to operate and / or monitor the following as they apply to the Loss of Condenser Vacuum: Rod position	2.5	62
059 / Accidental Liquid RadWaste Rel. / 9			X				AK2.02	Knowledge of the interrelations between the Accidental Liquid Radwaste Release and the following: Radioactive-gas monitors	2.7	63
067 / Plant Fire On-site / 8					X		AA1.03	Ability to operate and / or monitor the following as they apply to the Plant Fire on Site: Bypass of a fire zone detector	2.5	64
E09 / Functional Recovery						X	EA2.1	Ability to determine and interpret the following as they apply to the (Functional Recovery) Facility conditions and selection of appropriate procedures during abnormal and emergency operations.	3.2	65

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SONGS 2006  
NRC Written Examination Outline  
Emergency and Abnormal Plant Evolutions – Tier 1 Group 2

E/APE # / Name Safety Function	G	K1	K2	K3	A1	A2	Number	K/A Topic(s)	Imp.	Q#
K/A Category Point Total:	2/2	0	1	3	2	1/2	Group Point Total:			9/4

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System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Q#
003 Reactor Coolant Pump	X											2.1.23	Conduct of Operations: Ability to perform specific system and integrated plant procedures during all modes of plant operation.	4.0	86
013 Engineered Safety Features Actuation									X			A2.02	Ability to (a) predict the impacts of the following malfunctions or operations on the ESFAS; and (b) based Ability on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations; Excess steam demand	4.5	87
026 Containment Spray									X			A2.03	Ability to (a) predict the impacts of the following malfunctions or operations on the CSS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Failure of ESF	4.1	88
062 AC Electrical Distribution									X			A2.05	Ability to (a) predict the impacts of the following malfunctions or operations on the ac distribution system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Methods for re-energizing a dead bus	3.3	89
063 DC Electrical Distribution	X											2.4.6	Emergency Procedures / Plan Knowledge symptom based EOP mitigation strategies.	4.0	90
003 Reactor Coolant Pump								X				A1.05	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the RCPS controls including: RCS flow	3.4	1
003 Reactor Coolant Pump								X				A1.07	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the RCPS controls including: RCS temperature and pressure	3.4	2
004 Chemical and Volume Control		X										K1.10	Knowledge of the physical connections and/or cause-effect relationships between the CVCS and the following systems: Pneumatic valves and RHRS	2.7	3
005 Residual Heat Removal					X							K4.03	Knowledge of RHRS design feature(s) and/or interlock(s) which provide or the following: RHR heat exchanger bypass flow control	2.9	4
006 Emergency Core Cooling					X							K4.06	Knowledge of ECCS design feature(s) and/or interlock(s) which provide for the following: Recirculation of minimum flow through pumps	2.7	5
007 Pressurizer Relief/Quench Tank	X											2.1.28	Conduct of Operations: Knowledge of purpose and function of major system components and controls	3.2	6
008 Component Cooling Water	X											2.1.27	Conduct of Operations: Knowledge of system purpose and or function.	2.8	7

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System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Q#
010 Pressurizer Pressure Control		X										K1.01	Knowledge of the physical connections and/or cause-effect relationships between the PZR PCS and the following systems: RPS	3.9	8
012 Reactor Protection		X										K1.06	Knowledge of the physical connections and/or cause-effect relationships between the RPS and the following systems: T/G	3.1	9
012 Reactor Protection			X									K2.01	Knowledge of bus power supplies to the following: RPS channels, components, and interconnections	3.3	10
013 Engineered Safety Features Actuation						X						K5.02	Knowledge of the operational implications of the following concepts as they apply to the ESFAS: Safety system logic and reliability	2.9	11
022 Containment Cooling					X							K4.02	Knowledge of CCS design feature(s) and/or interlock(s) which provide for the following: Correlation of fan speed and flow path changes with containment pressure	3.1	12
022 Containment Cooling				X								K3.02	Containment equipment subject to damage by high or low temperature, humidity, and pressure Containment instrumentation readings	3.0	13
026 Containment Spray									X			A2.07	Ability to (a) predict the impacts of the following malfunctions or operations on the CSS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of Containment Spray Pump suction when in recirculation mode, possibly caused by clogged sump screen, pump inlet high temperature exceeded, cavitation, voiding, or sump below cutoff (interlock) limit	3.6	14
026 Containment Spray			X									K2.01	Knowledge of bus power supplies to the following: Containment spray pumps	3.4	15
039 Main and Reheat Steam								X				A1.09	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the MRSS controls including: Main steam line radiation monitors	2.5	16
059 Main Feedwater											X	A4.08	Ability to manually operate and monitor in the control room: Feedwater Regulating Valve Controller	3.0	17
061 Auxillary/Emergency Feedwater								X				A1.01	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the AFW controls including: S/G level	3.9	18
062 AC Electrical Distribution			X									K2.01	Knowledge of bus power supplies to the following: Major system loads	3.3	19

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System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Q#
063 DC Electrical Distribution									X			A2.01	Ability to (a) predict the impacts of the following malfunctions or operations on the dc electrical systems; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Grounds	2.5	20
064 Emergency Diesel Generator								X				A1.03	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ED/G system controls including: Operating voltages, currents, and temperatures	3.2	21
064 Emergency Diesel Generator							X					K6.07	Knowledge of the effect of a loss or malfunction of the following will have on the ED/G system: Air receivers	2.7	22
073 Process Radiation Monitoring								X				A1.01	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the PRM system controls including: Radiation levels	3.2	23
076 Service Water	X											2.1.27	Conduct of Operations: Knowledge of system purpose and or function.	2.8	24
076 Service Water					X							K4.02	Knowledge of SWS design feature(s) and/or interlock(s) which provide for the following: Automatic start features associated with SWS pump controls	2.9	25
078 Instrument Air											X	A4.01	Ability to manually operate and/or monitor in the control room: Pressure gauges	3.1	26
078 Instrument Air			X									K2.01	Knowledge of bus power supplies to the following Instrument air compressor	2.7	27
103 Containment										X		A3.01	Ability to monitor automatic operation of the Containment system, including: Containment Isolation	3.9	28
K/A Category Point Totals:	3/2	3	4	1	4	1	1	6	2/3	1	2	Group Point Total:			<b>28/5</b>

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System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Q#
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001 Control Rod Drive									X			A2.11	Ability to (a) predict the impacts of the following malfunction or operations on the CRDS- and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Situations requiring a reactor trip	4.7	91
014 Rod Position Indication	X											2.1.32	Conduct of Operations: Ability to explain and apply all system limits and precautions.	3.8	92
056 Condensate System									X			A2.04	Ability to (a) predict the impacts of the following malfunctions or operations on the Condensate System; and (b) based on those predictions, use Procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of Condensate Pumps	2.8	93
014 Rod Position Indication						X						K5.02	Knowledge of the operational implications of the following concepts as they apply to the RPIS: RPIS independent of demand position	2.8	29
015 Nuclear Instrumentation					X							K4.10	Knowledge of NIS design feature(s) and/or interlock(s) provide for the following: Redundant sources of information on power level	3.2	30
016 Non-nuclear Instrumentation						X						K5.01	Knowledge of the operational implication of the following concepts as they apply to the NNIS: Separation of control and protection circuits	2.7	31
017 In-core Temperature Monitor										X		A3.01	Ability to monitor automatic operation of the ITM system including: Indications of normal, natural, and interrupted circulation of RCS	3.6	32
029 Containment Purge				X								K3.02	Knowledge of the effect that a loss or malfunction of the Containment Purge System will have on the following: Containment entry	2.9	33
033 Spent Fuel Pool Cooling									X			A2.02	Ability to (a) predict the impacts of the following malfunctions or operations on the Spent Fuel Pool Cooling System ; and (b) based those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of SFPCS	2.7	34
034 Fuel Handling Equipment		X										K1.02	Knowledge of the physical connections and/or cause-effect relationships between the Fuel Handling System and the following systems: RHRS	2.5	35
041 Steam Dump/Turbine Bypass Control							X					K6.03	Knowledge of the effect of a loss or malfunction on the following will have on the SDS: Controller and positioners, including ICS, S/G, CRDS	2.7	36

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System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Q#
068 Liquid Radwaste										X		A3.02	Ability to monitor automatic operation of the Liquid Radwaste System including: Automatic isolation	3.6	37
071 Waste Gas Disposal							X					A3.02	Ability to monitor the automatic operation of the Waste Gas Disposal System including: Pressure Regulating System for Waste Gas Vent Header	2.8	38
K/A Category Point Totals:	0/1	1	0	1	1	2	2	0	1/2	2	0	Group Point Total:			<b>10/3</b>

Facility:	SONGS 2 & 3		Date of Exam:	10/23/2006			
Category	K/A #	Topic	RO		SRO-Only		
			IR	Q#	IR	Q#	
1. Conduct of Operations	2.1.12	Ability to apply technical specifications for a system.			4.0	94	
	2.1.5	Ability to locate and use procedures and directives related to shift staffing and activities.			3.4	95	
	2.1.1	Knowledge of conduct of operations requirements.	3.7	66			
	2.1.22	Ability to determine Mode of Operation.	2.8	67			
	Subtotal			2		2	
2. Equipment Control	2.2.7	Knowledge of the process for conducting tests or experiments not described in the safety analysis report.			3.2	96	
	2.2.34	Knowledge of the process for determining the internal and external effects on core reactivity.	2.8	68			
	2.2.12	Knowledge of surveillance procedures.	3.0	69			
	2.2.1	Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity.	3.7	70			
	2.2.2	Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels.	4.0	71			
	Subtotal			4		1	
3. Radiation Control	2.3.8	Knowledge of the process for performing a planned gaseous radioactive release.			3.2	97	
	2.3.3	Knowledge of SRO responsibilities for auxiliary systems that are outside the control room (e.g., waste disposal and handling systems).			2.9	98	
	2.3.9	Knowledge of the process for performing a containment purge.	2.5	72			
	2.3.11	Ability to control radiation releases.	2.7	73			
	Subtotal			2		2	
4. Emergency Procedures / Plan	2.4.30	Emergency Procedures / Plan Knowledge of which events related to system operations/status should be reported to outside agencies.			3.6	99	
	2.4.32	Knowledge of operator response to loss of all annunciators.			3.5	100	
	2.4.18	Knowledge of the specific bases for EOPs.	2.7	74			
	2.4.11	Knowledge of abnormal condition procedures.	3.4	75			
	Subtotal			2		2	
Tier 3 Point Total				10		7	

Tier / Group	Randomly Selected K/A	Reason for Rejection
2 / 1	062 A2.02	#89 – Excessive overlap to topic for #20. Randomly selected 062 A2.05
2 / 1	022 K4.05	#12 - Not plausible at SONGS / Ventilation ducts are encased in concrete. Randomly selected 022 K4.03
2 / 1	059 A4.10	#17 – Topic is specific to B&W plant design. Randomly selected 059 A4.08
2 / 2	028 A2.01	#93 - System abandoned in place. No procedural guidance applies. Randomly selected 056 A2.04
1 / 1	025 AK3.02	#45 - Not performed at facility. Interlocks removed. Randomly selected 025 AK3.01
1 / 1	038 EK3.04	#47 – No automatic actions associated with PRMs related to event
1 / 1	057 AA1.04	#51 – Valves are not powered from Vital Instrument AC. Randomly selected 057 AA1.06
1 / 2	005 G2.2.25	#57 – Removed TS Basis item for RO. Randomly selected 005 G2.1.23
2 / 1	026 A2.01	#88 – Phenomena is expected to occur for Westinghouse Plant designs. Recirc not same on CE designs. Randomly selected 026 A2.023
2 / 1	007 G2.2.25	#6 – No TS associated with Quench Tank. Randomly selected 007 G2.1.28
2 / 1	022 K4.03	#12 – No CIA on CCS at facility. Randomly selected 022 K4.02
2 / 2	033 A2.01	#34 – No relation between SFPCS and inadequate SDM. There would be no system actions to take based on loss of SDM. Randomly selected 033 A2.02
2 / 2	071 K3.04	#38 – Direct overlap with Simulator JPM S2. Randomly reselected 071 A3.02
1 / 1	027 G2.1.30	#77 – Direct Overlap with scenario event. Randomly reselected G2.1.23
2 / 1	026 A2.08	#14 – Direct Overlap with Simulator JPM S7. Randomly reselected 026 A2.07
1 / 2	005 G2.1.28	#82 – Impossible to develop a psychometrically sound SRO test item for the topic. Randomly reselected G2.1.12.
2 / 1	012 G2.1.28	Oversample topic G 2.1.28. Randomly reselected 012 topic from all available 012 KAs. 012 K1.06 selected
2 / 1	012 G2.1.2	Excessive overlap for G2.1 and 012 topic. Randomly reselected 012 topic from all available 012 KAs. 012 K2.01 selected.
2 / 1	103 A4.01	Impossible to develop a psychometrically sound item that matches the KA because topic requires operation of components that are automatically operated at the system level. Randomly reselected from 103 topic area. Chose 103 A3.01
1 / 1	E02 EK1.3	Excessive overlap with 007 topic. Randomly reselected KA 078 G2.1.2 from unselected EPE/APEs
1 / 1	054 AA1.02	Excessive overlap with E06 topic. Randomly reselected 029 EK1.05
1 / 1	025 AK3.01	Plant design and procedures do not support question for topic. Randomly reselected 025 AA2.02 from the 025 APE
3 / 4	G2.4.49	Topic selected was at RO level. Randomly reselected from among 2.4 topics and chose 2.4.30



Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New  X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge  X   
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41  X   
\_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>003 A1.07</u>	<u>          </u>
	Importance Rating	<u>3.4</u>	<u>          </u>

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the RCPS controls including: RCS temperature and pressure.

Proposed Question: Common 2

Given the following conditions:

- Unit 2 is in Mode 5.
- Tcold is 160°F.
- RCS pressure is 320 psia.
- Pressurizer level is 20%.
- RCPs are SECURED.

Which ONE (1) of the following describes the restriction in place for starting an RCP, and the reason why?

- A. SG pressure must be less than 260 psia; to prevent overpressurizing the SGs.
- B. SG pressure must be greater than 260 psia; to prevent a reactivity excursion due to a cold water accident.
- C. SG temperature must be less than 260°F; to prevent overpressurizing the RCS due to rapid heatup.
- D. SG temperature must be greater than 260°F; to prevent a reactivity excursion due to a cold water accident.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Concern is heatup of the RCS, not heat input to the SG. SG temperature is the parameter of concern
- B. Incorrect. Cold shutdown boron concentration will be sufficient to prevent a reactivity excursion. SG temperature, not pressure
- C. Correct.
- D. Incorrect. Wrong reason

Technical Reference(s) TS 3.4.7 and basis (Attach if not previously provided)  
\_\_\_\_\_

Proposed references to be provided to applicants during examination: TS 3.4.7; Steam Tables

Learning Objective: 23507 (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 X  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>004 K1.10</u>	<u>          </u>
	Importance Rating	<u>2.7</u>	<u>          </u>

Knowledge of the physical connections and/or cause-effect relationships between the CVCS and the following systems: Pneumatic valves and RHRS.

Proposed Question: Common 3

Given the following conditions:

- Unit 2 is in Mode 5.
- RCS pressure is 180 psia.
- RCS is aligned with SDC Purification in service.

Which ONE (1) of the following describes the alignment for Shutdown Cooling purification of the RCS?

Shutdown Cooling connects...

- downstream of the Letdown Heat Exchanger. Flow is controlled by the Letdown Backpressure Control Valve and LPSI isolation valves.
- upstream of the Letdown Heat Exchanger. Flow is controlled by the Letdown Backpressure Control Valve and LPSI isolation valves.
- downstream of the Letdown Heat Exchanger. Flow is controlled by the Letdown Flow Control valves.
- upstream of the Letdown Heat Exchanger. Flow is controlled by the Letdown Flow Control valves.

Proposed Answer: B.

Explanation (Optional):

- Incorrect. Connection is upstream of the LDHX
- Correct.
- Incorrect. Connection is upstream and Letdown backpressure valve controls the flow
- Incorrect. Flow control valves are for normal letdown

Technical Reference(s) [SD SO23-390](#) (Attach if not previously provided)

\_\_\_\_\_  
\_\_\_\_\_

Proposed references to be provided to applicants during examination: None

Learning Objective: 21356 (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 X  
\_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>005 K4.03</u>	<u>          </u>
	Importance Rating	<u>2.9</u>	<u>          </u>

Knowledge of RHRS design feature(s) and/or interlock(s) which provide or the following: RHR heat exchanger bypass flow control.

Proposed Question: Common 4

Given the following conditions:

- Unit 3 shutdown and cooldown to Mode 5 is in progress.
- Shutdown Cooling is in service.
- RCS temperature is 300°F.
- RCS cooldown rate is 20°F per hour.

To maintain a constant RCS cooldown rate, which ONE (1) of the following describes the operation of the Shutdown Cooling Heat Exchanger Bypass Valve as the plant is cooled down?

- A. Throttled closed to maintain constant cooldown rate as RCS temperature is reduced, with Heat Exchanger flow maintained constant.
- B. Throttled open to ensure total Shutdown Cooling flow is constant as the Heat Exchanger outlet valve is throttled closed.
- C. Throttled closed to ensure total Shutdown Cooling flow is constant as the Heat Exchanger outlet valve is throttled open.
- D. Throttled open to maintain constant cooldown rate as RCS temperature is reduced, with Heat Exchanger flow maintained constant.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Heat Exchanger flow will be maintained as necessary (Raised) to maintain cooldown rate.
- B. Incorrect. For a cooldown, the flow control valve will be throttles open as temperature is reduced
- C. Correct.

D. Incorrect. If the bypass valve is throttled open, more flow will go around the heat exchanger, and cooldown rate will not be maintained

Technical Reference(s) SD SO23-740 (Attach if not previously provided)  
\_\_\_\_\_

Proposed references to be provided to applicants during examination: None

Learning Objective: 22047 (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>006 K4.06</u>	<u>          </u>
	Importance Rating	<u>2.7</u>	<u>          </u>

Knowledge of ECCS design feature(s) and/or interlock(s) which provide for the following: Recirculation of minimum flow through pumps.

Proposed Question: Common 5

Given the following conditions:

- A large Loss of Coolant Accident is in progress.
- SIAS, CIAS, MSIS, CSAS, and RAS have actuated.
- RWST level is 16%.
- Containment emergency sump level is 20 feet.
- ECCS valves are in the following positions:
  - RWST outlet isolation valves HV9300/HV9301 OPEN.
  - Containment emergency sump outlet valves HV9302/HV9303 OPEN.
  - Containment emergency sump outlet valves HV9304/HV9305 OPEN.
  - SI pumps and Containment Spray pumps Mini-Flow isolation valves HV9306/HV9307 OPEN.

Which ONE (1) of the following valve pairs has failed to automatically reposition to its Recirculation Actuation Signal (RAS) position?

- A. HV9300/HV9301
- B. HV9302/HV9303
- C. HV9304/HV9305
- D. HV9306/HV9307

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. 9300 and 9301 will remain open until they are manually closed
- B. Incorrect. 9302 and 9303 open on a RAS signal
- C. Incorrect. 9304 and 9305 also receive an open signal on RAS
- D. Correct. Mini-flow isolation valves are required to close on RAS to prevent recirculation of

contaminated water to the RWST

Technical Reference(s) SO23-12-11, Att. 14, Step 2d (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 6808 (As available)

Question Source: Bank # 56698  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X  
\_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>007 G2.1.28</u>	<u>          </u>
	Importance Rating	<u>3.2</u>	<u>          </u>

Conduct of Operations: Knowledge of purpose and function of major system components and controls

Proposed Question: Common 6

Given the following Unit 2 conditions:

- Reactor tripped from 100% power.
- Pressurizer pressure = 1870 psia.
- Containment pressure = 3.8 psig.

Assuming no operator actions, which ONE (1) of the following states where RCP bleedoff flow is being directed?

- A. Volume Control Tank
- B. Reactor Coolant Drain Tank
- C. Quench Tank
- D. Containment Sump

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Normal flowpath of bleedoff flow
- B. Incorrect. RCDT is where the Quench Tank will drain to if it becomes full
- C. Correct. One of the functions of the Quench Tank is to contain CBO flow during CIAS conditions
- D. Incorrect. Quench Tank would relieve to the Containment Sump, but would not direct CBO flow directly to sump

KA Match: The Quench Tank has 2 functions. To receive Safety Valve discharge during normal operations and to receive relief valve discharge from low pressure relief valve discharge during abnormal operations. The item was selected to test the function of receiving discharge when CIAS conditions are present. The applicant must interpret stem conditions to understand CIAS is present and determine where the discharge is going. Higher cog level selected to ensure exam attributes were met for number of higher cog items

Technical Reference(s) SD-S023-360 (Attach if not previously provided)  
\_\_\_\_\_

Proposed references to be provided to applicants during examination: None

Learning Objective: 6686 (As available)

Question Source: Bank # 56683  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>008 G2.1.27</u>	<u>          </u>
	Importance Rating	<u>2.8</u>	<u>          </u>

Conduct of Operations: Knowledge of system purpose and or function.

Proposed Question: Common 7

Given the following conditions:

- Reactor startup is in progress.
- Shutdown CEAs fully withdrawn.
- Regulating CEAs in Group 4 being moved (partially withdrawn).
- AFW is in operation to maintain SG levels.
- An inadvertent CIAS signal occurs.

Which ONE (1) of the following actions is required?

- A. Trip the reactor due to isolation of Instrument Air to containment.
- B. Trip the reactor and then stop all RCPs due to loss of CCW to containment.
- C. Trip the reactor and then stop all RCPs due to loss of controlled bleedoff flow.
- D. Reinitiate feed to the SGs by overriding and opening the Aux. Feed Isolation valves.

Proposed Answer: B

Explanation (Optional):

The CCW containment isolation valves (HV-6211, 6223, 6236 & 6216) close on CIAS. This isolates cooling flow to RCP motors and seal coolers. With the trip breakers closed (Unit operating), the operator should trip the reactor (and turbine) and 5 seconds after verifying all CEAs inserted, should stop all RCPs to avoid bearing damage. Feed flow is NOT affected since AFW is supplying. Seal leakoff is affected, however flow is NOT stopped since the relief valve lifts. Charging flow is NOT affected but letdown is isolated.

KA Match: A function of CCW is to supply cooling water to containment. Lower cog KA topic, higher cog question selected to ensure exam attributes for higher cog were met. The item requires knowledge of CCW system function to answer correctly. This is also a high PRA operator action.

Technical Reference(s): SO23-13-17 (Attach if not previously provided)  
\_\_\_\_\_

Proposed references to be provided to applicants during examination: \_\_\_\_\_

Learning Objective: 19953 (As available)

Question Source: Bank # X  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>010 K1.01</u>	<u>          </u>
	Importance Rating	<u>3.9</u>	<u>          </u>

Knowledge of the physical connections and/or cause-effect relationships between the PZR PCS and the following systems: RPS.

Proposed Question: Common 8

Given the following conditions:

- Unit 3 is at 100% power.
- The following annunciators are received:
  - 50A04, PZR PRESSURE DEVIATION HI/LO
  - 50A14, PZR PRESSURE HI/LO

The RO determines that the selected channel for Pressurizer Pressure control, PT-0100X, is failing LOW.

If NO action is taken by the crew, which ONE (1) of the following describes the response of the plant?

- A. Reactor trip on Low Pressurizer Pressure.
- B. Heaters deenergize to maintain pressure between 2200 and 2225 psia.
- C. Spray valves open to maintain pressure at 2275 psia.
- D. Reactor Trip on High Pressurizer Pressure.

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. 1 control channel failing low will cause heaters to energize. No protective channels would see a low pressure
- B. Incorrect. Heaters do energize, but because the control channel has failed, they will not deenergize and RCS pressure will continue to rise.
- C. Incorrect. RCS pressure will rise above the spray valve setpoint but spray valves come off the output provided by the controlling channel, so they will not operate.

D. Correct. Heaters energize, and nothing happens to control pressure as it rises. Reactor trips on high PZR pressure

Technical Reference(s) SO23-13-27 (Attach if not previously provided)  
SD SO23-360

Proposed references to be provided to applicants during examination: None

Learning Objective: 19479 (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X  
\_\_\_\_\_

Comments:



10 CFR Part 55 Content: 55.41   X    
55.43           

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>012 K2.01</u>	<u>          </u>
	Importance Rating	<u>3.3</u>	<u>          </u>

Knowledge of bus power supplies to the following: RPS channels, components, and interconnections

Proposed Question: Common 10

Given the following conditions:

- Unit 2 is at 100% power.
- Pressurizer Level Control is selected to Channel X
- Pressurizer Pressure Control is selected to Channel X

Which ONE (1) of the following describes a result from a loss of Vital Instrument Bus 2Y02?

- A. CEAC 1 failure.
- B. All Pressurizer Heaters energize.
- C. All 3 Charging Pumps automatically start.
- D. Reactor trip due to a CPC channel B Aux Trip.

Proposed Answer: A

Explanation (Optional):

- A. A. Correct.
- B. Incorrect. Would be correct for channel Y loss of power (2Y01)
- C. Incorrect. Would be correct for channel Y loss of power (2Y01)
- D. Incorrect. Need more than 1 channel to trip to generate reactor trip on a CPC Aux Trip. Only 1 channel trips

Technical Reference(s) [SO23-13-18](#) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 55180 (As available)

Question Source: Bank #   X    
Modified Bank #            (Note changes or attach parent)  
New           

Question History: Last NRC Exam   10/2005 SONGS  

Question Cognitive Level: Memory or Fundamental Knowledge   X    
Comprehension or Analysis           

10 CFR Part 55 Content: 55.41   X    
          

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>013 K5.02</u>	<u>          </u>
	Importance Rating	<u>2.9</u>	<u>          </u>

Knowledge of the operational implications of the following concepts as they apply to the ESFAS: Safety system logic and reliability.

Proposed Question: Common 11

Given the following conditions:

- Unit 3 tripped from 100% power 15 minutes ago.
- MSIS and EFAS have actuated.
- No operator actions have been taken.

Which ONE (1) of the following sets of conditions would result in Auxiliary Feedwater flow to a Steam Generator?

- A. E088 pressure - 695 psia  
E089 pressure - 490 psia  
E088 NR level - 15%  
E089 NR level - 27%
- B. E088 pressure - 725 psia  
E089 pressure - 690 psia  
E088 NR level - 15%  
E089 NR level - 28%
- C. E088 pressure - 600 psia  
E089 pressure - 750 psia  
E088 NR level - 18%  
E089 NR level - 30%
- D. E088 pressure - 735 psia  
E089 pressure - 600 psia  
E088 NR level - 28%  
E089 NR level - 18%

Proposed Answer: A

Explanation (Optional):

- A. Correct. E088 has a higher pressure than E089. NR level in E088 is below 21%, so cycling relay will have AFW flow going to E088

- B. Incorrect. No feed below 760 psig until high enough DP between SGs
- C. Incorrect. Although E088 level is below the cycling relay setpoint for AFW, pressure is too low, so no AFW flow. E089 level is high, so cycling relays would have AFW flow off
- D. Incorrect. E088 level is too high. E089 level would have AFW flow but pressure is too low.

Technical Reference(s) [SD-SO23-780](#) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 21457 (As available)

Question Source: Bank # N40607  
 Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
 New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
 Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X  
 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>022 K4.02</u>	<u>          </u>
	Importance Rating	<u>3.1</u>	<u>          </u>

Knowledge of CCS design feature(s) and/or interlock(s) which provide for the following: Correlation of fan speed and flowpath changes with containment pressure.

Proposed Question: Common 12

Given the following:

- A reactor trip has occurred on Unit 3.
- RCS pressure is 1700 psia and lowering.
- Containment pressure is 6 psig and rising.
- All equipment is operating as designed.

Which ONE (1) of the following describes the status of Containment Cooling?

- A. 2 Normal Cooling Units operating, being supplied by Chilled Water.
- B. 4 Normal Cooling Units operating, being supplied by Chilled Water.
- C. 2 Emergency Cooling Units operating, being supplied by Component Cooling Water.
- D. 4 Emergency Cooling Units operating, being supplied by Component Cooling Water.

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. Conditions exist for SIAS/CIAS/CCAS. Normal Cooling with Chilled Water will not be aligned.
- B. Incorrect. Conditions for SIAS/CIAS/CCAS. 4 units will be operating, but in emergency mode
- C. Incorrect. All 4 Units will start in emergency mode with CCW flow on CCAS
- D. Correct.

Technical Reference(s) [SD SO23-770](#) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 23656 (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X  
\_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>022 K3.02</u>	<u>          </u>
	Importance Rating	<u>3.0</u>	<u>          </u>

Containment equipment subject to damage by high or low temperature, humidity, and pressure Containment instrumentation readings.

Proposed Question: Common 13

An ESDE resulting in a SIAS has occurred. Containment parameters have increased to the following values:

- Containment Temperature = 243°F.
- Containment Pressure = 12 psig.

Which ONE (1) of the following describes effects of the containment environment on the Pressurizer level instruments?

Indicated level is...

- LOWER than Actual level due to the high containment TEMPERATURE.
- LOWER than Actual level due to the high containment PRESSURE.
- HIGHER than Actual level due to the high containment TEMPERATURE.
- HIGHER than Actual level due to the high containment PRESSURE.

Proposed Answer: C

Explanation (Optional):

- Incorrect. Correct reason but opposite effect of reference leg heating
- Incorrect. Reading will be higher. Pressure effects are minimal, other than that the pressure is elevated due to high temperature
- Correct.
- Incorrect. Temperature is the cause, pressure in this case is a byproduct of temperature

Technical Reference(s) J-BBB-021, TLU Calc. and (Attach if not previously provided)  
Setpoint verification for  
Pressurizer Level

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Proposed references to be provided to applicants during examination: NoneLearning Objective: 20058 (As available)Question Source: Bank # A67922  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X10 CFR Part 55 Content: 55.41 X  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>026 A2.07</u>	<u>          </u>
	Importance Rating	<u>3.6</u>	<u>          </u>

Ability to (a) predict the impacts of the following malfunctions or operations on the CSS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of containment spray pump suction when in recirculation mode, possibly caused by clogged sump screen, pump inlet high temperature exceeded, cavitation, voiding, or sump level below cutoff (interlock) limit

Proposed Question: Common 14

Given the following conditions:

- A LOCA has occurred.
- Containment pressure peaked at 27 psig, now indicates 12 psig and lowering slowly.
- All required ECCS equipment is operating.
- RAS has occurred.
- Containment Emergency Sump level is 23.5 feet.
- The crew is evaluating RAS operation in IAW SO23-12-11, Attachment 14, RAS Operation.
- HPSI and Containment Spray pump amps, pressure, and flow are oscillating.

Which ONE (1) of the following describes why the conditions exist, and the action required in accordance with Attachment 14?

- A. The Containment Emergency Sump has blockage. Trip the Containment Spray Pumps and throttle HPSI to minimum requirements.
- B. The Containment Emergency Sump has blockage. Trip HPSI pump and throttle Spray flow to minimum requirements.
- C. Containment Emergency Sump level is below the minimum required. Trip the Containment Spray Pumps and throttle HPSI to minimum requirements.
- D. Containment Emergency Sump level is below the minimum required. Throttle HPSI pumps and throttle Spray flow to minimum requirements.

Proposed Answer: A

Explanation (Optional):

- A. Correct.
- B. Incorrect. Correct cause but Cnmt Spray Pumps are tripped.
- C. Incorrect. Incorrect cause but correct action. Cnmt level is >21 feet.
- D. Incorrect. Incorrect cause and action requires tripping Cnmt Spray pumps

Technical Reference(s) EOI 12-11, Att-14 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 19508 (As available)

Question Source: Bank # \_\_\_\_\_

Modified Bank # \_\_\_\_\_ (Note changes or attach parent)

New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X

\_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>026 K2.01</u>	<u>          </u>
	Importance Rating	<u>3.4</u>	<u>          </u>

Knowledge of bus power supplies to the following: Containment spray pumps.

Proposed Question: Common 15

Which ONE (1) of the following is the power supply to Unit 2 Containment Spray Pump P-013?

- A. 2A04
- B. 2A06
- C. 2B04
- D. 2B06

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. P-012 supply
- B. Correct. P-013 is B Train 4160 volts
- C. Incorrect. ESF Bus supplied by 2A04, but Spray is 4KV
- D. Incorrect. ESF Bus supplied by the bus that also supplies P-013

Technical Reference(s) [SD SO23-740](#) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 19707 (As available)

Question Source: Bank #             
 Modified Bank #            (Note changes or attach parent)  
 New X

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge   X    
Comprehension or Analysis           

10 CFR Part 55 Content: 55.41   X    
55.43           

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>039 A1.09</u>	<u>          </u>
	Importance Rating	<u>2.5</u>	<u>          </u>

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the MRSS controls including: Main steam line radiation monitors.

Proposed Question: Common 16

A Steam Generator Tube Rupture has occurred.

Which ONE (1) of the following radiation monitors will provide the MOST ACCURATE identification of the affected SG?

- A. Air Ejector LOW Range, RE-7818.
- B. Main Steam Line LOW Range, RE-7874-A1/B1.
- C. Air Ejector WIDE Range, RE-7870.
- D. Main Steam Line HIGH Range, RE-7875-A1/B1.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. Air ejector may be most immediate, but cannot distinguish SGs by AE monitor
- B. Correct.
- C. Incorrect. Air Ejector will indicate for a wide variety of rupture sizes, but cannot determine the SG by its reading
- D. Incorrect. Will indicate for large SGTRs, but Low Range will be most accurate

Technical Reference(s) [SD SO23-690](#) (Attach if not previously provided)  
SOER92-03

Proposed references to be provided to applicants during examination: None

Learning Objective: 23431 (As available)

Question Source: Bank #             
Modified Bank #            (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis   X  

10 CFR Part 55 Content: 55.41   X    
\_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>059 A4.08</u>	<u>          </u>
	Importance Rating	<u>3.0</u>	<u>          </u>

Ability to manually operate and monitor in the control room: Feedwater Regulating Valve Controller.

Proposed Question: Common 17

The crew is responding to a Feedwater Control System failure in accordance with AOI 13-24, Feedwater Control System Malfunctions.

The following conditions exist:

- SG E-088 level is approximately 10% above program and rising.
- SG E-089 level is approximately 3% above program and rising.
- SG E-088 Master Controller output is rising, and feedwater control valve is opening.
- SG E-089 Master Controller output is lowering, and feedwater control valve is closing.
- K-006 EAP/MSC speed is lowering.
- K-005 EAP/MSC speed is lowering.

Which ONE (1) of the following actions is required next?

- A. Place SG E-088 Master Controller in Preferred Manual and lower output.
- B. Place SG E-088 Feedwater Control Valve in manual and throttle in the close position.
- C. Place K-006 EAP/MSC in Manual and raise output.
- D. Place K-005 EAP/MSC in Manual and raise output.

Proposed Answer: A

Explanation (Optional):

- A. Correct. The component NOT operating correctly is SG E088 Master Controller. Place in Pref Manual.
- B. Incorrect. The FCV is opening because the Master is calling for it to open
- C and D. Incorrect. EAP/MSC for each Feed Pump is operating the way it should be. Level rising, output lowering

Technical Reference(s): SO23-13-24 Att 1 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 23272 (As available)

Question Source: Bank # \_\_\_\_\_

Modified Bank # X (Note changes or attach parent)

New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X

55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>061 A1.01</u>	<u>          </u>
	Importance Rating	<u>3.9</u>	<u>          </u>

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the AFW controls including: S/G level.

Proposed Question: Common 18

Given the following:

- The Reactor has tripped.
- Steam Generator E089 level indicates below the EFAS setpoint.
- EFAS-1 has not actuated automatically.
- SG Pressure in E089 is 900 psia.

Which ONE (1) of the following describes the MINIMUM action required to fully initiate an **EFAS-1** to maintain Steam Generator E089 level on the **cycling relays**?

- A. Depress two (2) EFAS-1 manual trip buttons in the Control Room one (1) time.
- B. Depress two (2) EFAS-1 manual trip buttons in the Control Room two (2) times.
- C. Depress all four (4) EFAS-1 manual trip buttons in the Control Room one (1) time.
- D. Depress all four (4) EFAS-1 manual trip buttons in the Control Room two (2) times.

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. All 4 PBs must be depressed twice. Once for continuous operation of EFAS and once more for cycling
- B. Incorrect. Must press all 4
- C. Incorrect. Must press twice
- D. Correct.

Technical Reference(s) [SO23-3-2.22](#) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 22479 (As available)

Question Source: Bank # A1074  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 X  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>062 K2.01</u>	<u>          </u>
	Importance Rating	<u>3.3</u>	<u>          </u>

Knowledge of bus power supplies to the following: Major system loads.

Proposed Question:           Common 19

What is the normal source of 6.9 kV power to the Unit 2 Reactor Coolant Pumps during full power operations?

- A.    Main Transformer 2XM
- B.    Unit Auxiliary Transformer 2XU2
- C.    Reserve Auxiliary Transformer 2XR3
- D.    Reserve Auxiliary Transformer 3XR3

Proposed Answer:            B

Explanation (Optional):

- A.    Incorrect. 2XM provides output to switchyard
- B.    Correct.
- C.    Incorrect. RAT is alternate supply if UAT is lost
- D.    Incorrect. RAT is alternate supply for Unit 3 RCPs if 3XU2 is lost

Technical Reference(s)    [SD SO23-360](#)                   (Attach if not previously provided)  
                                   [SD-SO23-120](#)

Proposed references to be provided to applicants during examination: None

Learning Objective:       20742                   (As available)

Question Source:           Bank #               P3449  
                                   Modified Bank #                        (Note changes or attach parent)  
                                   New                             

Question History:         Last NRC Exam             

Question Cognitive Level: Memory or Fundamental Knowledge   X  
                                   Comprehension or Analysis

10 CFR Part 55 Content: 55.41   X    
55.43           

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>063 A2.01</u>	<u>          </u>
	Importance Rating	<u>2.5</u>	<u>          </u>

Ability to (a) predict the impacts of the following malfunctions or operations on the dc electrical systems; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Grounds.

Proposed Question: Common 20

Given the following conditions:

- Unit 2 is at 100% power.
- The following alarm is received:
  - 63A32, 2D1 125 VDC BUS TROUBLE

An operator is dispatched to determine if there is a ground on 125 VDC Bus 2D1.

Which ONE (1) of the following describes how the location of the ground may be determined, and the first action required to identify and isolate it if the ground is not readily identifiable?

One of the ground detector LEDs on the DC Bus Panel will be...

- A. extinguished. Isolate the battery charger from the DC Bus.
- B. extinguished. Isolate individual loads from the DC Bus.
- C. solidly illuminated. Isolate the battery charger from the DC Bus.
- D. solidly illuminated. Isolate individual loads from the DC Bus.

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. Ground LED extinguished means no ground. Isolate charger only after attempting to isolate loads
- B. Incorrect. Wrong condition but correct action
- C. Incorrect. Correct condition but charger is not disconnected unless ground cannot be located on loads

D. Correct.

Technical Reference(s) 63A32 (Attach if not previously provided)  
\_\_\_\_\_

Proposed references to be provided to applicants during examination: None

Learning Objective: 19857 (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X  
\_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>064 A1.03</u>	<u>          </u>
	Importance Rating	<u>3.2</u>	<u>          </u>

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ED/G system controls including: Operating voltages, currents, and temperatures.

Proposed Question: Common 21

Given the following conditions:

- Emergency Diesel Generator surveillance is in progress.
- 2G003 is fully loaded on bus 2A06.
- A Switchyard low voltage alarm is received:
  - Switchyard voltage is 218 kV and steady.

Operator response per SO23-13-4, Operation During Major System Disturbances, requires unloading the emergency diesel generator and opening the output breaker.

Which ONE (1) of the following describes the reason for this action in SO23-13-4?

- A. To enable the Degraded Voltage protection circuit.
- B. To restore Unit 2 to within the Technical Specification Limiting Condition for Operation (LCO) for EDG operability.
- C. To raise bus voltage, preventing potential damage to normally running bus loads.
- D. To prevent EDG trip on generator differential overcurrent.

Proposed Answer: A

Explanation (Optional):

- A. Correct. Degraded voltage will not be enabled if the EDG is tied to the bus
- B. Incorrect. EDG operability is not tied to bus voltage
- C. Incorrect. Switchyard voltage is low, so bus voltage will not be raised by stopping the EDG
- D. Incorrect. EDG overcurrent setpoint is significantly higher than the currents seen if switchyard voltage is low

Technical Reference(s) SO23-13-4 (Attach if not previously provided)  
\_\_\_\_\_

Proposed references to be provided to applicants during examination: None

Learning Objective: 23939 (As available)

Question Source: Bank # X  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X  
\_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>064 K6.07</u>	<u>          </u>
	Importance Rating	<u>2.7</u>	<u>          </u>

Knowledge of the effect of a loss or malfunction of the following will have on the ED/G system: Air receivers.

Proposed Question:           Common 22

An air leak on an air receiver for EDG 2G002 requires isolating the #1 air starting subsystem for repairs.

With the outlet isolation valve closed for this air receiver (assume no other valve or component manipulations), which ONE (1) of the following describes the effect on the EDG if an automatic start signal is received?

- A.    The EDG will NOT start because starting air is isolated.
- B.    The EDG will start but the air system capacity may not be high enough to start the EDG within the required 10 seconds.
- C.    The EDG will start because starting air will be provided to the in-service air start motors by the other air system.
- D.    The EDG will start because the air start systems are cross-connected downstream of each air receiver.

Proposed Answer:           C

Explanation (Optional):

- A.    Incorrect. Only half of the air is isolated
- B.    Incorrect. Each air system is 100% capacity
- C.    Correct. On a start signal, all the air start valves will open.
- D.    Incorrect. NO cross-connect

Technical Reference(s)    [SD SO23-750](#)                   (Attach if not previously provided)

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Proposed references to be provided to applicants during examination: None

Learning Objective:       23899                                   (As available)

Question Source: Bank #   X    
Modified Bank #            (Note changes or attach parent)  
New           

Question History: Last NRC Exam   YES  

Question Cognitive Level: Memory or Fundamental Knowledge   X    
Comprehension or Analysis           

10 CFR Part 55 Content: 55.41   X    
          

Comments:  
A lot of editorial mods

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>073 A1.01</u>	<u>          </u>
	Importance Rating	<u>3.2</u>	<u>          </u>

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the PRM system controls including: Radiation levels.

Proposed Question:           Common 23

Given the following conditions:

- Unit 3 is in MODE 6.
- Irradiated Fuel movement is in progress.
- A spent fuel assembly is damaged while being transported to the spent fuel racks.
- Spent Fuel Pool area radiation high alarm is in.
- Spent Fuel Handling Building air exhaust process radiation monitors, RE-7822 and RE-7823, high alarms are in.

Which ONE (1) of the following describes the resulting ventilation alignment?

- A. Fuel Handling Building normal supply fan trips.  
Fuel Handling Building normal exhaust fan remains running.  
Fuel Handling Building PACUs take suction from the Fuel Handling Building intake dampers and discharge downstream of the Fuel Handling Building normal exhaust fan.
- B. Fuel Handling Building normal supply and exhaust fans are tripped.  
Fuel Handling Building PACUs take suction from the Fuel Handling Building atmosphere and discharge back to the Fuel Handling Building atmosphere.
- C. Fuel Handling Building normal supply fan trips.  
Fuel Handling Building normal exhaust fan remains running.  
Fuel Handling Building PACUs take suction from Fuel Handling Building Intake dampers and discharge back to the Fuel Handling Building atmosphere.
- D. Fuel Handling Building normal supply and exhaust fans are tripped.  
Fuel Handling Building PACUs take suction from the Fuel Handling Building intake dampers and discharge downstream of the Fuel Handling Building normal exhaust fan.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. Discharge would allow radioactive release
- B. Correct.
- C. Incorrect. Both fans will trip
- D. Incorrect. Would allow a release

Technical Reference(s): [SD-SO23-430](#) (Attach if not previously provided)

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\_\_\_\_\_

Proposed references to be provided to applicants during examination: None

Learning Objective: 20969 (As available)

Question Source: Bank # X  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam X

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 X  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>076 G2.1.27</u>	<u>          </u>
	Importance Rating	<u>2.8</u>	<u>          </u>

Conduct of Operations: Knowledge of system purpose and or function.

Proposed Question: Common 24

Which ONE (1) of the following ensures the operability of the Saltwater Cooling System pumps upon a loss of normal Service Water?

- A. Pumps can run without bearing seal water for 2.5 hours.
- B. Bearing Seal Water Backup comes off of the Saltwater Cooling Pump Discharge.
- C. The condensate system can supply bearing seal water to the pumps.
- D. TPCW can supply bearing seal water to the pumps.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. Backup supply is available in case of loss
- B. Correct.
- C. Incorrect. Wrong system. Condensate supplies bearing seal supply to other secondary components
- D. Incorrect. TPCW not aligned as backup for NSW

KA Match: Salt Water Cooling System at SONGS has the same function as the Service Water System at other facilities. One of the functions of the SWC system is to supply its own bearing cooling water to maintain system operability. Normal Service Water at SONGS is similar to Domestic Water at other facilities.

Technical Reference(s) [SD SO23-410](#) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 19651 (As available)

Question Source: Bank # N58175  
Modified Bank #            (Note changes or attach parent)

New

\_\_\_\_\_  
\_\_\_\_\_

Question History:

Last NRC Exam

\_\_\_\_\_

Question Cognitive Level:

Memory or Fundamental Knowledge  
Comprehension or Analysis

X  
\_\_\_\_\_

10 CFR Part 55 Content:

55.41

X  
X

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>076 K4.02</u>	<u>          </u>
	Importance Rating	<u>2.9</u>	<u>          </u>

Knowledge of SWS design feature(s) and/or interlock(s) which provide for the following: Automatic start features associated with SWS pump controls.

Proposed Question: Common 25

Given the following conditions:

- Train B CCW/SWC is in service.
- Train A is in Standby with SWC P-112 aligned.

Which ONE (1) of the following describes the subsequent operation of SWC Pump P-112 if an automatic SIAS signal is generated?

- Immediately starts automatically.
- Starts automatically in approximately 20 seconds.
- Must be manually started, and will start 5 seconds after the START Pushbutton is depressed.
- Will start automatically 5 seconds after the associated CCW pump starts, but must be manually started if no CCW pump starts.

Proposed Answer: B

Explanation (Optional):

On SIAS, SWC starts at 20 seconds. SWC will start on CCW start, but on SIAS does not need CCW start

Technical Reference(s): [SD-SO23-410, 2.3.2](#) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 6253 (As available)

Question Source: Bank #  X   
Modified Bank #   (Note changes or attach parent)  
New

Question History: Last NRC Exam  YES

Question Cognitive Level: Memory or Fundamental Knowledge    
Comprehension or Analysis  X

10 CFR Part 55 Content: 55.41  X   
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>078 A4.01</u>	<u>          </u>
	Importance Rating	<u>3.1</u>	<u>          </u>

Ability to manually operate and/or monitor in the control room: Pressure gauges.

Proposed Question: Common 26

Given the following conditions:

- Unit 2 and 3 are at 100% power.
- The following alarms are received in the control room:
  - 61C19, INST AIR HEADER PRESS LOW
  - 61B39, INST AIR DRYER TEMP/LVL/DP HI
- 2PI5344A and 3PI5344A, Instrument Air Header Pressure, both indicate 85 psig and lowering slowly.
- All Instrument Air Compressors are running.
- An operator has been dispatched to locally check instrument air flow and pressure indication.

Which ONE (1) of the following actions will be performed next?

- A. Trip the reactor; perform EOI 12-1, Standard Post Trip Actions.
- B. Open SA2417MU036, Air Dryer Bypass Valve. Place the standby instrument air filter in service.
- C. Place Auxiliary Spray in service per SO23-3-1.10 and operate charging pumps as necessary to maintain pressurizer level.
- D. Fail open in-service Salt Water Cooling discharge valves to prevent a loss of Salt Water Cooling system flow.

Proposed Answer: B

Explanation (Optional):

Indications of dryer blockage, procedure requires swapping filters. Do not meet trip criteria, and other actions would take place later

Technical Reference(s): SO23-13-5 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 21390 (As available)

Question Source: Bank # X  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>078 K2.01</u>	<u>          </u>
	Importance Rating	<u>2.7</u>	<u>          </u>

Knowledge of bus power supplies to the following Instrument air compressor.

Proposed Question:           Common 27

Which ONE (1) of the following describes the power supply arrangement to the Instrument Air Compressors?

	<u>C001</u>	<u>C002</u>	<u>C003</u>
A.	2B06	B10	3B06
B.	B10	2B07	3B07
C.	2B07	B10	3B07
D.	2A04	3A04	B10

Proposed Answer:           B

Explanation (Optional):

- A.     Incorrect. C001 from B10, C002 from 2B07, C003 from 3B07
- B.     Correct.
- C.     Incorrect. Correct for C003
- D.     Incorrect. C001 from B10, C002 from 2B07, C003 from 3B07

Technical Reference(s):   [SD SO23-570](#)                   (Attach if not previously provided)

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Proposed references to be provided to applicants during examination: None

Learning Objective:       23858                   (As available)

Question Source:         Bank #                   \_\_\_\_\_

                              Modified Bank #       \_\_\_\_\_ (Note changes or attach parent)

New

X

Question History:

Last NRC Exam

Question Cognitive Level:

Memory or Fundamental Knowledge  
Comprehension or Analysis

X

10 CFR Part 55 Content:

55.41 X

55.43 \_\_\_\_\_

Comments:



Proposed references to be provided to applicants during examination: None

Learning Objective: 23455 (As available)

Question Source: Bank # X  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>2</u>	<u>          </u>
	K/A #	<u>014 K5.02</u>	<u>          </u>
	Importance Rating	<u>2.8</u>	<u>          </u>

Knowledge of the operational implications of the following concepts as they apply to the RPIS: RPIS independent of demand position.

Proposed Question:           Common 29

Given the following conditions:

- With Unit 2 at 50% power, 1 full length CEA is dropped to the bottom of the core.

Which ONE (1) of the following describes the most accurate indication of the dropped rod, and the reason why?

- Reed Switch Position Transmitters; they provide separate contacts that indicate a CEA is dropped.
- Reed Switch Position Transmitters; they provide input to CEA upper and lower electrical limits.
- CEA Pulse Counters; they provide positive indication of CEA position by inputting to the plant computer and CEAC displays.
- CEA Pulse Counters; they provide input to CEAC 1 and 2, providing input to the Core Protection Calculator for CEA penalty factors.

Proposed Answer:           A

Explanation (Optional):

- Correct.
- Incorrect. CEA Upper and Lower limits provide for CEA stops. In vicinity of dropped rod for lower, but does not indicate a dropped rod
- Incorrect. Although they do provide input, they would not be indicative of a single dropped CEA
- Incorrect. Penalty factors are generated from actual position, not demand

Technical Reference(s)   [SD SO23-510](#)                   (Attach if not previously provided)

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Proposed references to be provided to applicants during examination: NoneLearning Objective: 23822 (As available)Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X10 CFR Part 55 Content: 55.41 X  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>2</u>	<u>          </u>
	K/A #	<u>015 K4.10</u>	<u>          </u>
	Importance Rating	<u>3.2</u>	<u>          </u>

Knowledge of NIS design feature(s) and/or interlock(s) provide for the following: Redundant sources of information on power level.

Proposed Question: Common 30

Which ONE (1) of the following accurately describes why a partially inserted CEA could cause a difference between the green pen and red pen indications of the Safety Channel Excore Linear Power recorders (JR-0002) on CR-56?

- A. CPC power is corrected for rod shadowing effects while Excore power is not.
- B. Excore power is corrected for rod shadowing effects while CPC power is not.
- C. CPC and Excore power indications are derived from different detector systems.
- D. CPC power is corrected for both Tc and rod shadowing while Excore power is only corrected for Tc shadowing.

Proposed Answer: A

Explanation (Optional):

- A. Correct. CPC power is corrected
- B. Incorrect. Opposite of actual
- C. Incorrect. Same system input, just different outputs
- D. Incorrect. Correction is for rod shadowing, not changes in TC

Technical Reference(s) SD-SO23-470 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 54674 (As available)

Question Source: Bank # N3653  
 Modified Bank #            (Note changes or attach parent)  
 New           

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge   X    
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41   X    
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>2</u>	<u>          </u>
	K/A #	<u>016 K5.01</u>	<u>          </u>
	Importance Rating	<u>2.7</u>	<u>          </u>

Knowledge of the operational implication of the following concepts as they apply to the NNIS: Separation of control and protection circuits.

Proposed Question: Common 31

Which ONE (1) of the following describes how the control signals and plant protection signals generated by RCS loop temperatures function?

- A. Separate detectors are used for protection and control.
- B. Each detector is provided with two separate outputs; one for control, one for protection.
- C. Isolation amplifiers from the output of each detector ensure that feedback from the control signal will not affect the protection channel.
- D. Detector outputs are multiplexed to be processed separately by the control and protection circuitry.

Proposed Answer: A

Explanation (Optional):

- A. Correct. RCS temperature inputs are specifically separated for protection and control. Different transmitters are used for each function, as well as input for other indications
- B. Incorrect.
- C. Incorrect. Isolation amplifiers are typically used in RPS circuitry to minimize noise or feedback between RPS components
- D. Incorrect. Multiplexing is used in RPS to carry many signals over a limited number of circuits

Technical Reference(s) [SD SO23-360](#) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 19494 (As available)

Question Source: Bank #

Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New  X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge  X   
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41  X   
\_\_\_\_\_

Comments:



Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis  X

10 CFR Part 55 Content: 55.41  X   
\_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>2</u>	<u>          </u>
	K/A #	<u>029 K3.02</u>	<u>          </u>
	Importance Rating	<u>2.9</u>	<u>          </u>

Knowledge of the effect that a loss or malfunction of the Containment Purge System will have on the following: Containment entry.

Proposed Question: Common 33

Given the following conditions:

- Unit 2 is at 100% power.
- An entry into Containment is planned.
- Chemistry has determined the Oxygen level is 16.2%.
- Containment Mini Purge supply fan is out of service due to an overcurrent fault on the motor.

In accordance with SO23-3-2.34, Containment Access Control, Inspections, and Airlock Operation, which ONE (1) of the following states a requirement that must be met for entry into containment?

- A. Defeat emergency and personnel airlocks, open all four doors and start the mini purge exhaust fan.
- B. Self – contained respiratory protection will be required upon initial Containment entry.
- C. Access is limited to 63-foot level and below. Gantry crane access is not allowed.
- D. Place Main Purge Supply and Exhaust fans in service prior to Containment entry.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. Not allowed at 100% power
- B. Correct. 24 hours for purge prior to containment entry
- C. Incorrect. Assumption that nitrogen lighter than air is not relied on for entry
- D. Incorrect. Not allowed at 100% power

Technical Reference(s) SO 23-3-2.34 Containment (Attach if not previously provided)

access control, Inspections and  
airlocks operation

Proposed references to be provided to applicants during examination: None

Learning Objective: 20237 (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>2</u>	<u>          </u>
	K/A #	<u>033 A2.02</u>	<u>          </u>
	Importance Rating	<u>3.0</u>	<u>          </u>

Ability to (a) predict the impacts of the following malfunctions or operations on the Spent Fuel Pool Cooling System ; and (b) based those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of SPFCs.

Proposed Question: Common 34

Given the following conditions:

- Unit 3 is in Mode 1.
- Spent Fuel Pool Level has been lowering.
- The crew is performing actions of AOI SO23-13-23, Loss of Spent Fuel Cooling.
- The source of the leak has NOT been determined.
- The Spent Fuel Pool Cooling Discharge Siphon Breaker is uncovered.

Which ONE (1) of the following describes the impact of this condition, and the action that is required in accordance with AOI SO23-13-23?

- A. The SFP Cooling Pumps may become air-bound. Stop any running SFP Cooling Pump, and vent the casing prior to restarting.
- B. The SFP Cooling Pumps may become air-bound. Stop the running SFP Cooling Pump, initiate makeup to the Spent Fuel Pool, start the standby SFP Cooling Pump.
- C. Fuel Handling Building Airborne Radiation Levels may increase due to agitation of the bottom of the SFP. Initiate 1 Train of FHIS while making up to the SFP.
- D. Fuel Handling Building Airborne Radiation Levels may increase due to the decreased shielding of SFP water. Initiate makeup via NSW hose which should be submerged more than 3 ft below the surface of the water.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Action can be performed, but air binding is not a consideration at this level
- B. Incorrect. The discharge siphon breaker uncovering is not a concern for air binding of the

- pumps
- C. Correct.
- D. Incorrect. Makeup would not be from NSW hose

Technical Reference(s) AOI SO23-13-23 (Attach if not previously provided)  
\_\_\_\_\_

Proposed references to be provided to applicants during examination: None

Learning Objective: 19588 (As available)

Question Source: Bank # \_\_\_\_\_  
 Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
 New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
 Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X  
 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>2</u>	<u>          </u>
	K/A #	<u>034 K1.02</u>	<u>          </u>
	Importance Rating	<u>2.5</u>	<u>          </u>

Knowledge of the physical connections and/or cause-effect relationships between the Fuel Handling System and the following systems: RHRS.

Proposed Question: Common 35

Which ONE (1) of the following describes the Shutdown Cooling System relationship with Refueling Operations?

- A. Used to fill, drain, and cool the Refueling Pool. Provides the primary means of Spent Fuel Pool Cooling and Purification during Refueling operations.
- B. Used to fill, drain, and cool the Refueling Pool. Serves as a backup for SFP Cooling.
- C. Used for primary means of Spent Fuel Pool makeup from RWST. May be run in parallel with the SFP Cooling System when heat load is high.
- D. Used for primary means of Spent Fuel Pool makeup from RWST. Provides primary means of Spent Fuel Pool Cooling and Purification during Refueling operations.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. Not primary means of cooling/purification
- B. Correct.
- C. Incorrect. Not primary makeup for SFP.
- D. Incorrect. Not primary means of makeup or cooling, but may be used for both as a backup

Technical Reference(s) [SD SO23-430](#) (Attach if not previously provided)  
SD SO23-740

Proposed references to be provided to applicants during examination: None

Learning Objective: 21356 (As available)

Question Source: Bank #

Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New  X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge  X   
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41  X   
\_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>2</u>	<u>          </u>
	K/A #	<u>041 K6.03</u>	<u>          </u>
	Importance Rating	<u>2.7</u>	<u>          </u>

Knowledge of the effect of a loss or malfunction on the following will have on the SDS: Controller and positioners, including ICS, S/G, CRDS.

Proposed Question: Common 36

With the Unit at 100% power, the Steam Bypass Control System (SBCS) Master Controller is in AUTO with the remote setpoint selected.

Individual valves are aligned as follows:

<u>Valve</u>	<u>Controller</u>	<u>Permissive</u>
#1 HV8423	Manual	Auto
#2 HV8424	Auto	Manual
#3 HV8425	Auto	Auto
#4 HV8426	Manual	Manual

Which SBCS valve would automatically open if the Master Controller output fails high?

- A. #1
- B. #2
- C. #3
- D. #4

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. Controller in Manual, output fails high, valve will remain closed
- B. Correct. If Permissive is set in manual, then the valve is armed to open. When output fails high with the controller in auto, the valve will open.
- C. Incorrect. With valve and permissive in auto, requires 2 inputs to make the valve open. Controller failing will only provide 1 input
- D. Incorrect. Controller and permissive in manual, valve will not respond to controller output failure

Technical Reference(s) SD SO23-175 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 22949 (As available)

Question Source: Bank # X  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X  
\_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>2</u>	<u>          </u>
	K/A #	<u>068 A3.02</u>	<u>          </u>
	Importance Rating	<u>3.6</u>	<u>          </u>

Ability to monitor automatic operation of the Liquid Radwaste System including: Automatic isolation.

Proposed Question: Common 37

Which ONE (1) of the following pairs contains ONLY radiation monitors with automatic actuations associated with rising radiation levels?

- A. CCW Non-Critical Loop, RE7819; Radwaste Condensate Return, RE7812.
- B. Containment Area Low Range, RE7845; BPS Neutralization Sump RE7817.
- C. Turbine Building Sump Discharge RE7821; CCW Non-Critical Loop RE7819.
- D. BPS Neutralization Sump RE7817; Turbine Building Sump Discharge RE7821.

Proposed Answer: D

Explanation (Optional):

- A. Incorrect.
- B. Incorrect.
- C. Incorrect.
- D. Correct. Each of the other choices contains only 1 radiation monitor with automatic action

Technical Reference(s) [SD-SO23-690 section 2.3.4](#) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 7578 (As available)

Question Source: Bank # X  
 Modified Bank #            (Note changes or attach parent)  
 New           

Question History: Last NRC Exam           

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

\_\_\_\_\_  
\_\_\_\_\_

10 CFR Part 55 Content: 55.41   X    
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>2</u>	<u>          </u>
	K/A #	<u>071 K3.04</u>	<u>          </u>
	Importance Rating	<u>2.7</u>	<u>          </u>

Ability to monitor automatic operation of the Waste Gas System including: Pressure regulating system for waste gas vent header  
Proposed Question: Common 38

Given the following conditions:

- Unit 2 is in Mode 4 during an RCS heatup.
- The Waste Gas system has all controls in automatic with Gas Decay Tank T-085 in service with a pressure of 240 psig.
- Waste Gas Compressor 2C-010 is in LEAD; 2C-011 is in STANDBY.
- NO releases are in progress.
- Waste Gas Surge Tank pressure has risen to 3.2 psig and is stable.

Which ONE (1) of the following describes the operation of the Waste Gas System in this condition?

- A. BOTH Waste Gas Compressors are RUNNING; Waste Gas Surge Tank Pressure Control valve, PCV-7200 is OPEN.
- B. BOTH Waste Gas Compressors are RUNNING; Waste Gas Surge Tank Pressure Control valve, PCV-7200 is CLOSED.
- C. Waste Gas Compressor 2C-010 is RUNNING; Waste Gas Compressor 2C-011 remains in STANDBY; Waste Gas Surge Tank Pressure Control valve, PCV-7200 is CLOSED.
- D. Waste Gas Compressors are OFF; Waste Gas Surge Tank Pressure Control valve, PCV-7200, is OPEN, maintaining system pressure.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. PCV-7200 will be closed when pressure is high. It only opens on low pressure, < 0.5 psig
- B. Correct.
- C. Incorrect. > 3 psig, both compressors will be running

D. Incorrect. Conditions for a low pressure situation, <0.5 psig

Technical Reference(s) SD SO23-660 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 20111 (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X  
\_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>1</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>007 EA1.01</u>	<u>          </u>
	Importance Rating	<u>3.7</u>	<u>          </u>

Ability to operate and monitor the following as they apply to a reactor trip: T/G controls.

Proposed Question: Common 39

Unit 2 Reactor/Turbine trip has occurred, and the following conditions exist:

- Unit Output Breakers 4062 and 6062 are still closed and could not be opened from the Control Room.
- Local Breaker Failure Backup (LBFBU) actuation has not occurred.
- All Main Turbine Stop and Governor Valves are closed.
- Main Turbine speed is 1800 RPM and stable.

Which ONE (1) of the following actions is immediately required?

- Manually trip the Main Turbine.
- Close the Main Steam Isolation Valves (MSIVs).
- Transfer 2/3 L224 to Unit 3 power, and again attempt to open Unit Output Breakers 4062 and 6062.
- Deenergize the Unit 2 Reserve Aux Transformers to prevent fault propagation to the 1E and non-1E buses.

Proposed Answer: C

Explanation (Optional):

- Incorrect. Turbine already tripped. Problem is OP breaker
- Incorrect. Additional action for turbine trip in same RNO
- Correct.
- Incorrect. Additional action that could be performed for different set of plant conditions.

Technical Reference(s) SO23-12-1 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 22484 (As available)

Question Source: Bank # B53595  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X \_\_\_\_\_

10 CFR Part 55 Content: 55.41 X  
\_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	008 G2.1.32	
	Importance Rating	3.4	

Conduct of Operations: Ability to explain and apply all system limits and precautions.

Proposed Question: Common 40

Given the following conditions:

- A LOCA has occurred.
- RCS subcooling is 7°F and trending down.
- Pressurizer level is 100% and steady.
- HPSI injection valves are fully open.
- No RCP's are running.
- Containment temperature is 235°F.
- Containment pressure is 11 psig.

Which ONE (1) of the following actions will be performed by the crew?

- A. Secure HPSI pumps to allow RCS to depressurize so maximum injection flow with the LPSI system can be achieved.
- B. Throttle HPSI flow to allow depressurization of the primary system and prevent pressurized thermal shock.
- C. Throttle HPSI flow to restore pressurizer level to indicating range.
- D. Continue maximum HPSI injection flow to ensure adequate cooling for the core.

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. NO subcooling available to perform this, although PZR level is sat
- B. Incorrect. Subcooling not high enough to throttle HPSI
- C. Incorrect. Throttling HPSI in this condition would be actions similar to TMI
- D. Correct.

KA Match: This item is testing whether the applicant can apply the minimum RCS subcooling limit to actions taken during a vapor space accident. Other parameter limits are satisfied but subcooling is not.

Technical Reference(s) FS-7 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 22801 (As available)

Question Source: Bank # X  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X  
\_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	009 EK3.22	
	Importance Rating	4.4	

Knowledge of the reasons for the following responses as they apply to the small break LOCA: Maintenance of heat sink.

Proposed Question: Common 41

Given the following plant conditions:

- A small break LOCA is in progress and SIAS has actuated.
- All systems are operating as expected.

Per the stated conditions, which ONE (1) of the following is the basis for maintaining a secondary heat sink?

- Reflux boiling is the primary means of heat removal prior to voiding in the hot legs.
- To minimize boron stratification of the RCS.
- RCS pressure may remain so high that cooling from the injection flow alone is inadequate to remove decay heat.
- To provide for Containment temperature and pressure control.

Proposed Answer: C

Explanation (Optional):

- Incorrect. Reflux after voiding hot legs
- Incorrect. Not the reason, but is a byproduct of maintaining natural circulation in the RCS
- Correct.
- Incorrect. Cnmt pressure and temperature control would benefit from lower temperature RCS/ECCS mixtures but not the basis for maintaining heat sink

Technical Reference(s) [SO23-14-03](#) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 23232 (As available)

Question Source: Bank # X  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 X  
\_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	_____
	Group #	1	_____
	K/A #	011 EK1.01	_____
	Importance Rating	4.1	_____

Knowledge of the operational implications of the following concepts as they apply to the Large Break LOCA: Natural circulation and cooling, including reflux boiling.

Proposed Question: Common 42

Given the following conditions:

- A LOCA has occurred on Unit 2.
- RCS pressure is 500 psia.

Which ONE (1) of the following actions will enhance RCS heat removal?

- Raise SG ADV setpoint to prevent or collapse RCS voids.
- Raise RCS makeup to increase RCS inventory.
- Raising AFW flow to increase SG inventory.
- Raise RCS pressure to increase RCS subcooling.

Proposed Answer: C

Explanation (Optional):

- Incorrect. Raising SP will reduce heat removal by lowering DT between RCS and SG
- Incorrect. With pressure at 500 psig, raising RCS makeup will do very little to even restore inventory. Makeup is already maxed
- Correct. Higher SG levels will enhance 2 phase natural circulation flow
- Incorrect. Raising RCS pressure under normal circumstances will reduce voiding and enhance flow, but at 500 psig, it cannot be performed

Technical Reference(s) SO23-12-3 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 21217 (As available)

Question Source: Bank # \_\_\_\_\_

Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New  X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis  X

10 CFR Part 55 Content: 55.41  X   
\_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	_____
	Group #	1	_____
	K/A #	015 AK2.08	_____
	Importance Rating	2.6	_____

Knowledge of the interrelations between the Reactor Coolant Pump Malfunctions (Loss of RC Flow) and the following: CCWS.

Proposed Question: Common 43

Given the following conditions:

- A total loss of CCW has just occurred.
- The crew has entered SO23-13-7, Loss of Component Cooling Water (CCW)/Saltwater Cooling (SWC).
  - RCP Thrust Bearing temperatures are 205°F and rising at 2°F per minute.
  - RCP Seal Return temperature is 180°F and rising at 1°F every 2 minutes.
  - RCP Seal DPs are within normal ranges.

If CCW flow cannot be restored, what is the MAXIMUM time allowed by the AOI before the reactor must be tripped?

- A. 1 minute.
- B. 5 minutes.
- C. 8 minutes.
- D. 10 minutes.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. Additional time available for conditions presented
- B. Correct. Maximum of 5 minutes allowed for loss of CCW
- C. Incorrect. RCP temperatures are in the range of trip requirements
- D. Incorrect. RCP temperatures would be above the range for trip requirements

Technical Reference(s) SO23-13-7 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 19634 (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 X  
\_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	022 AA2.02	
	Importance Rating	3.2	

Ability to determine and interpret the following as they apply to the Loss of Reactor Coolant Pump Makeup: Charging pump problems.

Proposed Question: Common 44

Given the following conditions:

- Unit 2 is at 100% power.
- The following alarms are received:
  - 50A23, PZR LEVEL ERROR LO
  - 58A01, REGEN HX TSH 9267 LETDOWN TEMP HI

-The RO determines that all PZR level instrumentation is trending down.

-Letdown flow is 35 GPM and trending down.

-The crew enters AOI SO23-13-27, Pressurizer Pressure and Level Malfunction.

-The trends continue as before.

Of the choices below, which ONE (1) is the probable cause?

- A. Letdown Flow Controller failure.
- B. Loss of Charging flow.
- C. Pressurizer level controller setpoint failure.
- D. Letdown backpressure control valve input failure.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. PZR and letdown trending down, flow controller is acting correctly
- B. Correct.
- C. Incorrect. If setpoint failure was the cause, placing in manual would correct it
- D. Incorrect. If backpressure control valve input failed, PZR level and letdown flow would be trending in opposite directions

Technical Reference(s) SO23-13-27 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 19457 (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X  
\_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	_____
	Group #	1	_____
	K/A #	025 AA2.02	_____
	Importance Rating	3.4	_____

Ability to determine and interpret the following as they apply to the Loss of Residual Heat Removal System: Leakage of reactor coolant from RHR into closed cooling water system or into reactor building atmosphere

Proposed Question: Common 45

Given the following conditions:

- Unit 2 is shutdown on Shutdown Cooling.
- Cooldown is in progress at 40°F/hr.
- RCS Temperature is 280°F.
- RCS pressure is 300 psia.
- Train B CCW Surge Tank Level has risen from 40% to 55% in 20 minutes.
- Pressurizer Level is 60% and stable.
- VCT level dropped from 77% to 73% in 20 minutes.

Which ONE (1) of the following components is causing the CCW Surge Tank Level rise?

- CEDM Cooler leak.
- Spent Fuel Pool heat exchanger tube leak.
- Shutdown Cooling heat exchanger tube leak.
- Steam Generator sample cooler leak.

Proposed Answer: C

Explanation (Optional):

The only component presented here with higher pressure than CCW during shutdown is the SDC HX

Technical Reference(s): AOI SO23-13-7 step 9.b (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # X (WTSI)  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	_____
	Group #	1	_____
	K/A #	026 AA2.03	_____
	Importance Rating	2.6	_____

Ability to determine and interpret the following as they apply to the Loss of Component Cooling Water: The valve lineups necessary to restart the CCWS while bypassing the portion of the system causing the abnormal condition.

Proposed Question: Common 46

Given the following conditions:

- Unit 2 is at 100% power.
- CCW Non-Critical Loop is supplied by Train A.
- A CCW leak is occurring.
- CCW Surge Tank T-003 level is lowering slowly.
- The crew is taking action to locate and isolate the leak in accordance with AOI SO23-13-7, Loss of CCW/SWC.

Which ONE (1) of the following describes the initial action required to attempt to identify the CCW leak per the AOI?

- Trip Reactor, stop Reactor Coolant Pumps 5 sec later, then Isolate Non-Critical Loop.
- Isolate the Letdown Heat Exchanger.
- Isolate Radwaste CCW header from Unit 2.
- Place Emergency Chillers on Train B.

Proposed Answer: C

Explanation (Optional):

- Incorrect. May be performed later if necessary
- Incorrect. May be performed later if necessary
- Correct.
- Incorrect. May be performed later if taking loop out of service

Technical Reference(s) SO23-13-7 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 23382 (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 X  
\_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	038 EK3.06	
	Importance Rating	3.9	

Knowledge of the reasons for the following responses as they apply to the SGTR: Actions contained in EOP for RCS Water Inventory Balance, SG Tube Rupture, and Plant Shutdown procedures.

Proposed Question: Common 47

Given the following conditions:

- A Steam Generator Tube Rupture has occurred on SG E-089.
- Actions of SO23-12-4, SGTR, are being taken.
- SG E-089 level is off-scale high.
- Pressurizer level is off-scale low.
- ECCS is operating as designed.
- SG E-089 has just been isolated.
- RCS pressure is 1250 psia and slowly lowering.
- SG E-089 pressure is 1050 psia and slowly rising.

Which ONE (1) of the following actions is required, and the reason for the action?

- A. Commence lowering RCS pressure to prevent lifting Steam Generator safeties.
- B. Raise the setpoint of SG E-089 ADV to minimize radiological release.
- C. Open SG E-089 MSIV to prevent overpressurization of the ruptured SG.
- D. Maintain RCS pressure greater than SG E-089 pressure to minimize RCS dilution.

Proposed Answer: A

Explanation (Optional):

Do not open MSIV for isolated ruptured SG. Do not raise ADV setpoint, because water could issue from SVs. SG-E089 cooldown cannot commence because the SGTR transient is still in progress

Technical Reference(s): EOI 12-4 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 21291 (As available)

Question Source: Bank # X  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	_____
	Group #	1	_____
	K/A #	029 EK1.05	_____
	Importance Rating	2.8	_____

Knowledge of the operational implications of the following concepts as they apply to the ATWS: definition of negative temperature coefficient as applied to large PWR coolant systems.

Proposed Question: Common 48

At 100% power End of Cycle (EOC) conditions, which ONE (1) of the following will provide the most negative reactivity insertion within the first minute following an ATWS?

- A. Manual Turbine Trip.
- B. RCS boration at 10 gpm.
- C. Manual CEA insertion at 30 inches per minute.
- D. Closing a failed open SBCS valve.

Proposed Answer: A

Explanation (Optional):

Boration takes time to take effect because of the piping arrangement

Manual CEA insertion takes time to take effect because one group at a time are inserted

Isolating an ESDE doesn't add negative reactivity, it stops positive reactivity from being added

Technical Reference(s): Note 1 (Attach if not previously provided)  
\_\_\_\_\_

Proposed references to be provided to applicants during examination: None

Learning Objective: \_\_\_\_\_ (As available)

Question Source: Bank # X (WTSI)  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)

New

\_\_\_\_\_  
\_\_\_\_\_

Question History:

Last NRC Exam

\_\_\_\_\_

Question Cognitive Level:

Memory or Fundamental Knowledge  
Comprehension or Analysis

\_\_\_\_\_  
X  
\_\_\_\_\_

10 CFR Part 55 Content:

55.41 X  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>1</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>055 EK3.01</u>	<u>          </u>
	Importance Rating	<u>2.7</u>	<u>          </u>

Knowledge of the reasons for the following responses as they apply to the Station Blackout: Length of time for which battery capacity is designed.

Proposed Question:           Common 49

Which ONE (1) of the following describes the reason for reducing DC loads on Battery Bus 2D1 during a Station Blackout?

Reducing Bus 2D1 loads increases the availability from...

- A.    90 minutes to 2 hours
- B.    90 minutes to 4 hours
- C.    2 hours to 4 hours
- D.    4 hours to 8 hours

Proposed Answer:            B

Explanation (Optional):

- A.    Incorrect. Load shedding extends life to 4 hours
- B.    Correct.
- C.    Incorrect. 2 hours after load shedding
- D.    Incorrect. 2D1 is lower capacity. Other non vital batteries are designed for 4 hours

Technical Reference(s)    [SD SO23-140](#)                   (Attach if not previously provided)

\_\_\_\_\_

Proposed references to be provided to applicants during examination: None

Learning Objective:       19454                   (As available)

Question Source:           Bank #                             

                                  Modified Bank #                            (Note changes or attach parent)

                                  New                      X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge   X    
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41   X    
\_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	_____
	Group #	1	_____
	K/A #	056 AK1.04	_____
	Importance Rating	3.1	_____

Knowledge of the operational implications of the following concepts as they apply to Loss of Offsite Power: Definition of saturation conditions, implication for the systems.

Proposed Question: Common 50

Unit 3 is operating at 100% power when a Loss of Off-Site power causes a reactor trip. Ten minutes after the trip, the following conditions exist:

- SG E088 Pressure is 1040 psia and stable.
- SG E089 Pressure is 1035 psia and stable.
- All RCPs are OFF.
- PZR Pressure is 2200 psia and stable.
- That is approximately 578°F in both loops and rising.
- REPCET is 598°F.
- Tcold is approximately 558°F in both loops and rising.

Which ONE (1) of the following describes the status of RCS Heat Removal?

- A. Natural Circulation exists. The SBCS control valves are maintaining heat removal.
- B. Natural Circulation does not exist. Heat removal may be established by opening the SBCS control valves.
- C. Natural Circulation exists. ADVs are maintaining heat removal.
- D. Natural Circulation does not exist. Heat removal may be established by opening the ADVs.

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. On a loss of off site power, SBCS is unavailable due to loss of circulating water pumps.
- B. Incorrect. On a loss of off site power, SBCS is unavailable due to loss of circulating water pumps.
- C. Incorrect. No Natural Circ based on steam table indications, with Tcold approximately 15 degrees higher than saturation pressure of both SGs. REP CET and That are not within

16 degrees, so flow has stagnated. Tcold and That are rising.

D. Correct. Tcold should be lowered by approximately 15 degrees to establish a driving head for RCS flow. Th and REP CET will become closer in value as steam flow is raised.

Technical Reference(s) SO23-12-11, Att. 2, Floating Step 3 (Attach if not previously provided)  
[SO23-12-1, Step 6a RNO](#)

Proposed references to be provided to applicants during examination: Steam Tables

Learning Objective: 22021 (As available)

Question Source: Bank # X  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X  
\_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	_____
	Group #	1	_____
	K/A #	057 AA1.06	_____
	Importance Rating	3.5	_____

Ability to operate and / or monitor the following as they apply to the Loss of Vital AC Instrument Bus: Manual control of components for which automatic control is lost.

Proposed Question: Common 51

Given the following conditions:

- Unit 3 is at 100% power.
- Pressurizer Level Control is selected to channel LI-0110Y.
- A loss of Inverter Y002 occurs due to overcurrent on the inverter output breaker.
- The crew confirms that all other inverters are energized.

Which ONE (1) of the following describes the NEXT action to be taken in accordance with AOI SO23-13-18, Reactor Protection System Failure/Loss of Vital Bus?

- Select Pressurizer Level Select Switch HS-0110 to Level Channel LI-0110X.
- Close EFAS Trip Path 2 and 4 control valves.
- Reset and Reenergize pressurizer heaters.
- Ensure all Reactor Trip Circuit Breakers are closed.

Proposed Answer: A

Explanation (Optional):

- Correct.
- Incorrect. Would check trip paths actuated, but would not operate valves
- Incorrect. Only after controller in manual
- Incorrect. Only after restoration of the inverter or instrument bus

Technical Reference(s) SO23-13-18 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 22714 (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>1</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>058 AA1.03</u>	<u>          </u>
	Importance Rating	<u>3.1</u>	<u>          </u>

Ability to operate and / or monitor the following as they apply to the Loss of DC Power: Vital and battery bus components.

Proposed Question: Common 52

Given the following conditions:

- Unit 2 is in Mode 1, with all equipment operating normally.
- A loss of 480VAC MCC 2BY occurs.

Prior to any action by the crew, which ONE (1) of the following describes the power alignment to vital bus Y01?

- Powered from normal source from Inverter Y001 with Battery Charger B001.
- Powered from normal source from Inverter Y001 with Battery B007 (Battery Bank A).
- Powered from alternate source through inverter Static Switch transfer.
- De-energized until manually aligned to alternate source with Manual Transfer Switch.

Proposed Answer: B

Explanation (Optional):

- Incorrect.
- Correct. MCC 2BY will cause a loss of power to the Battery Charger supplying the battery for the inverter specified,
- Incorrect.
- Incorrect.

Technical Reference(s) SD-SO23-140, Section 2.1.1 (Attach if not previously provided)  
[SD-SO23-130, Section 2.1.1](#)

Proposed references to be provided to applicants during examination: None

Learning Objective: 23963 (As available)

Question Source: Bank # X  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	1	
	K/A #	062 G2.4.6	
	Importance Rating	3.1	

Emergency Procedures / Plan Knowledge symptom based EOP mitigation strategies.

Proposed Question: Common 53

Given the following conditions:

- A reactor trip has occurred.
- The crew is performing actions per SO23-12-2, Reactor Trip Recovery.
- Train A is supplying CCW Non-Critical Loop.
- SWC P-112 TRIPPED and CANNOT be restarted.

Which ONE (1) of the following actions is required for the Salt Water Cooling failure?

- Trip all RCPs.
- Stop Train A CCW Pumps then transfer all loads to Train B.
- Ensure all ECCS pumps are stopped.
- Place the CCW non-critical loop on the opposite train.

Proposed Answer: D

Explanation (Optional):

- Incorrect. Only when temperatures or time require trip
- Incorrect. Would place Train B in service but not by transferring all loads
- Incorrect. Ensure pumps stopped if not required due to loss of cooling, but only for affected train
- Correct.

Technical Reference(s) SO23-13-7 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 21133 (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New  X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis  X

10 CFR Part 55 Content: 55.41  X   
\_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	_____
	Group #	1	_____
	K/A #	065 G2.1.2	_____
	Importance Rating	3.0	_____

Loss of Instrument Air: Knowledge of operator responsibilities during all modes of plant operation

Proposed Question: Common 54

Given the following conditions:

- Unit 2 is at 100% power.
- 61B58, INSTR AIR COMPRESSOR CONTROL PANEL TROUBLE alarm is received.
- The Nitrogen Backup Supply is maintaining pressure on the Instrument Air Header.

Which ONE (1) of the following describes when an “orderly plant shutdown” will be initiated in accordance with SO23-13-5, Loss of Instrument Air?

- A. Immediately.
- B. When Instrument Air header pressure falls below 50 psig with no chance of recovery.
- C. When it is determined that normal supply system pressure cannot be restored or maintained.
- D. When control of feedwater flow or pressurizer pressure is lost or the Containment Air header isolates.

Proposed Answer: C

Explanation (Optional):

A is incorrect because conditions do not yet exist for a plant shutdown. B is incorrect because it is beyond the point (60 psig) where a reactor trip would be required. D is incorrect because manual control of those systems would be attempted while attempting to restore air pressure

Technical Reference(s): SO23-13-5 (Attach if not previously provided)

\_\_\_\_\_

Proposed references to be provided to applicants during examination: None

Learning Objective: 21390 (As available)

Question Source: Bank #     X      
Modified Bank #                      (Note changes or attach parent)  
New                     

Question History: Last NRC Exam                     

Question Cognitive Level: Memory or Fundamental Knowledge                       
Comprehension or Analysis     X    

10 CFR Part 55 Content: 55.41     X      
55.43                     

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	_____
	Group #	1	_____
	K/A #	E05 EA2.1	_____
	Importance Rating	2.7	_____

Ability to determine and interpret the following as they apply to the (Excess Steam Demand) Facility conditions and selection of appropriate procedures during abnormal and emergency operations.

Proposed Question: Common 55

Given the following conditions:

- A reactor trip has occurred.
- Off-Site power has been lost.
- Containment pressure is 12 psig and rising slowly.
- Containment Radiation levels are normal.
- RCS pressure is 1725 psia and lowering slowly.
- SG E-088 pressure indicates 860 psia and lowering slowly.
- SG E-089 pressure indicates 720 psia and lowering slowly.

Which ONE (1) of the following procedures will be used to mitigate this event?

- A. SO23-12-2, Reactor Trip Recovery.
- B. SO23-12-7, LOOP/LOFC.
- C. SO23-12-5, ESDE.
- D. SO23-12-3, Loss of Coolant Accident.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Indications are for another event due to plant upset
- B. Incorrect. Conditions exist, but also another event
- C. Correct. SG pressure lowering
- D. Incorrect. Containment radiation is not rising

Technical Reference(s) [EOI 12-1, diagnostic](#) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: none

Learning Objective: 22814 (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X  
X

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	_____
	Group #	1	_____
	K/A #	E06 EA1.2	_____
	Importance Rating	3.4	_____

Ability to operate and / or monitor the following as they apply to the (Loss of Feedwater) Operating behavior characteristics of the facility.

Proposed Question: Common 56

Given the following plant conditions:

- A Loss of Feedwater has occurred on Unit 2.
- The crew is performing actions of SO23-12-6, Loss of Feedwater.
- AFW Pump P-140 has just been restored.
- SG Levels are both indicating approximately 25% WR.

Which ONE (1) of the following describes the initial method required to restore AFW flow?

- Feed at the maximum rate to restore secondary heat sink.
- Feed at the maximum rate to enhance single phase natural circulation cooling.
- Feed at a reduced rate to minimize RCS cooldown.
- Feed at a reduced rate to minimize thermal shock to SG components.

Proposed Answer: D

Explanation (Optional):

- Incorrect. Goal is to restore heat sink, but feed slowly under these conditions
- Incorrect. Feeding would enhance cooling, but rate too high for conditions
- Incorrect. Correct actions, wrong reason
- Correct.

Technical Reference(s) SO23-14-6 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 21284 (As available)



Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	_____
	Group #	2	_____
	K/A #	005 G2.1.23	_____
	Importance Rating	3.9	_____

Conduct of Operations: Ability to perform specific and integrated plant procedures during all modes of plant operation

Proposed Question: Common 57

Unit 2 is operating at 75% power with all CEAs fully withdrawn, when a group 6 CEA drops to the bottom of the core.

Assuming the rod cannot be immediately recovered, what is the MINIMUM REQUIRED Power Reduction one hour after the CEA drop?

- A. 2%
- B. 5%
- C. 10%
- D. 15%

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. Would not be low enough in power
- B. Correct.
- C. Incorrect. Too far
- D. Incorrect. Too far

Technical Reference(s) SO23-13-13 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 22896 (As available)

Question Source: Bank # X  
 Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
 New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge   X    
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41   X    
\_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	024 AK3.02	
	Importance Rating	4.2	

Knowledge of the reasons for the following responses as they apply to the Emergency Boration: Actions contained in EOP for emergency boration.

Proposed Question: Common 58

Which ONE (1) of the following describes a reason for initiating an emergency boration due to multiple Full Length CEAs being stuck while performing Standard Post Trip Actions?

- A. To insert negative reactivity in the event that the Main Turbine fails to trip.
- B. To ensure Technical Specification Shutdown Margin requirements are met.
- C. Emergency boration is the ONLY means available to shut down the reactor if the Manual reactor trip pushbuttons do not function.
- D. Boration flow is required because the Diverse Scram System (DSS) is not credited in the SONGS Safety Analysis.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. ATWS and turbine fail to trip are different events for the SPTAs. While boration will provide the function, the reason is different
- B. Correct.
- C. Incorrect. Other methods available, such as inserting CEAs manually, opening PG breakers.
- D. Incorrect. Although DSS is not credited, it is not the reason boration flow is required

Technical Reference(s): SO23-14-1 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 20142 (As available)

Question Source: Bank #  X   
Modified Bank #   (Note changes or attach parent)  
New

Question History: Last NRC Exam  YES

Question Cognitive Level: Memory or Fundamental Knowledge  X   
Comprehension or Analysis

10 CFR Part 55 Content: 55.41  X   
55.43

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	028 G2.1.27	
	Importance Rating	2.8	

Conduct of Operations: Knowledge of system purpose and or function.

Proposed Question: Common 59

Which ONE (1) of the following describes the purpose of the Thot input to the Pressurizer Level Control System, and the response of the system if the input failed to its current value during a plant power reduction?

- A. Provides input to Tavg to determine reference level. Failure would cause actual Pzr level to be lower than program level during a power reduction.
- B. Provides input to Tavg to determine reference level. Failure would cause actual Pzr level to be higher than program level during a power reduction.
- C. Provides input directly to the master controller to determine reference level. Failure would cause actual Pzr level to be lower than program level during a power reduction.
- D. Provides input directly to the master controller to determine reference level. Failure would cause actual Pzr level to be higher than program level during a power reduction.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. Failure mode would maintain level too high as RCS temperature input would reflect full load Tavg
- B. Correct.
- C. Incorrect. Input to Tavg; level higher, not lower
- D. Incorrect. Input to Tavg

Technical Reference(s) [SD SO23-360](#) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 20059 (As available)

Question Source: Bank # N5743  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X  
\_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	_____
	Group #	2	_____
	K/A #	032 AK3.01	_____
	Importance Rating	3.2	_____

Knowledge of the reasons for the following responses as they apply to the Loss of Source Range Nuclear Instrumentation: Startup termination on source-range loss.

Proposed Question: Common 60

Given the following conditions:

- The Unit is in MODE 3.
- A Reactor Startup is in progress.
- CEAs are being withdrawn.
- Both Startup Channels have just failed to zero.

Which ONE (1) of the following is the reason that CEA withdrawal is stopped?

- A. CPCs will NOT be enabled during the power increase.
- B. Startup rate CANNOT be monitored without the Startup channels.
- C. Tech Spec LCS requires immediate suspension of positive reactivity additions.
- D. Tech Spec LCO requires the Audio Count Rate Monitor to be OPERABLE during a reactor Startup.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. CPCs may be enabled without SR
- B. Incorrect. Startup rate can be monitored, just not using the SR channels
- C. Correct.
- D. Incorrect. Audio count rate required for SD, not required by TS during startup

Technical Reference(s) TS Basis 3.3.1.1 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 23519 (As available)Question Source: Bank # N38163  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_10 CFR Part 55 Content: 55.41 X  
55.43 X

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	_____
	Group #	2	_____
	K/A #	037 AK3.07	_____
	Importance Rating	4.2	_____

Knowledge of the reasons for the following responses as they apply to the Steam Generator Tube Leak: Actions contained in EOP for S/G tube leak.

Proposed Question: Common 61

During a Steam Generator Tube Rupture, the crew is cooling down and depressurizing the RCS in accordance with SO23-12-4, Steam Generator Tube Rupture.

When does reducing RCS pressure take priority over maintaining minimum RCP NPSH requirements?

- A. When pressurizer level is rising rapidly.
- B. When ruptured Steam Generator level is rising rapidly.
- C. When the ruptured Steam Generator is also suspected of having an ESDE.
- D. When intact SG level cannot be maintained at the minimum level for RCS cooldown.

Proposed Answer: B

Explanation (Optional):

Maintaining NPSH and subcooling takes priority unless ruptured SG level is rising uncontrollably. Minimizing rad release by reducing RCS pressure below the SG ADV setpoint then becomes priority

Technical Reference(s): EOI 12-4 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 19453 (As available)

Question Source: Bank #     X      
Modified Bank #                      (Note changes or attach parent)  
New                     

Question History: Last NRC Exam                     

Question Cognitive Level: Memory or Fundamental Knowledge     X      
Comprehension or Analysis                     

10 CFR Part 55 Content: 55.41     X      
55.43                     

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>051 AA1.04</u>	<u>          </u>
	Importance Rating	<u>2.5</u>	<u>          </u>

Ability to operate and / or monitor the following as they apply to the Loss of Condenser Vacuum: Rod position.

Proposed Question: Common 62

Given the following:

- Unit 2 is at 100% power, **EOC**.
- RCS Boron Concentration is 28 ppm.
- A loss of condenser vacuum is occurring.
- The crew is performing actions of SO23-13-10, Loss of Condenser Vacuum.
- A power reduction is required.

Which ONE (1) of the following describes the operation of CEAs during the power reduction?

- A. Remain in their current position as long as turbine load reduction and RCS boration are effective in stabilizing vacuum.
- B. Inserted to maintain Tcold on program and ASI in the target band.
- C. Withdrawn to maintain Tcold on program and ASI in the target band.
- D. CEAs will be tripped due to inability to control ASI with a loss of condenser vacuum at EOC conditions.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. Would not borate at EOC. This would be correct for other times in cycle
- B. Correct.
- C. Incorrect. CEAS would have to be inserted as load is reduced. May be withdrawn if purpose was only for ASI control
- D. Incorrect. ASI may be controlled at EOC for loss of vacuum. May not be able to control for other events involving CEA mispositioning

Technical Reference(s) SO23-5-1.7 (Attach if not previously provided)  
\_\_\_\_\_

Proposed references to be provided to applicants during examination: None

Learning Objective: 19750 (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X  
\_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>059 AK2.02</u>	<u>          </u>
	Importance Rating	<u>2.7</u>	<u>          </u>

Knowledge of the interrelations between the Accidental Liquid Radwaste Release and the following: Radioactive-gas monitors.

Proposed Question: Common 63

Given the following:

- The plant is at 100% power.
- NO radioactive releases are in progress.
- Radwaste Secondary Tank T-057 has developed a large leak at the tank outlet.

Which ONE (1) of the following radiation monitors will be the first to indicate a high activity?

- Liquid Waste Discharge Monitor, RE7813.
- Plant Vent Stack Wide Range Monitor RE7865.
- BPS Neutralization Sump Monitor RE7817.
- Radwaste Condensate Return radiation monitor, RE7812.

Proposed Answer: B

Explanation (Optional):

- Incorrect. Flow is not through the discharge
- Correct. Activity would be seen in atmosphere and picked up through vent stack discharge
- Incorrect. Leak would not flow to the BPS Neutralization Sump
- Incorrect. Condensate return alarms for radwaste processes. Tank would not drain to radwaste in an area that would be picked up by the monitor

Technical Reference(s) SD SO23-690 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 19763 (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X  
\_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>1</u>	<u>          </u>
	Group #	<u>2</u>	<u>          </u>
	K/A #	<u>067 AA1.03</u>	<u>          </u>
	Importance Rating	<u>2.5</u>	<u>          </u>

Ability to operate and / or monitor the following as they apply to the Plant Fire on Site: Bypass of a fire zone detector.

Proposed Question: Common 64

In accordance with SO23-7-8, Fire System Computer Use and Operation, who may remove a fire zone point from scan?

- A. Fire Dept. Shift Captain.
- B. Instrumentation and Controls (I&C) Dept.
- C. SRO Operations Supervisor.
- D. Any licensed operator assigned to the shift.

Proposed Answer: A

Explanation (Optional):

- A. Correct. Direct from procedure
- B. Incorrect.
- C. Incorrect.
- D. Incorrect.

Technical Reference(s) SO23-7-8 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: NONE (As available)

Question Source: Bank #             
 Modified Bank #            (Note changes or attach parent)  
 New X

Question History: Last NRC Exam           

Question Cognitive Level: Memory or Fundamental Knowledge X

Comprehension or Analysis

\_\_\_\_\_  
\_\_\_\_\_

10 CFR Part 55 Content: 55.41   X    
\_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>2</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>E09 EA2.1</u>	<u>          </u>
	Importance Rating	<u>3.2</u>	<u>          </u>

Ability to determine and interpret the following as they apply to the (Functional Recovery) Facility conditions and selection of appropriate procedures during abnormal and emergency operations.

Proposed Question: Common 65

A major earthquake occurred ten minutes ago.

The Reactor has tripped and the following conditions exist on Unit 2:

- A loss of the switchyard has occurred.
- Both SGs are at 17% NR level and no AFW flow can be established to either SG.
- Pressurizer Level is 12% and lowering.
- Containment Radiation Monitors are trending upscale.

Which ONE (1) of the following is the appropriate Emergency Operating Instruction to mitigate this event?

- A. SO23-12-8, Station Blackout.
- B. SO23-12-6, Loss of Feedwater.
- C. SO23-12-7, Loss of Forced Circulation / Loss of Offsite Power.
- D. SO23-12-9, Functional Recovery.

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. No loss of ESF busses indicated
- B. Incorrect. One of 2 events ongoing
- C. Incorrect. Conditions do exist, but other events are taking place
- D. Correct. Loss of Feed and a LOCA are occurring

Technical Reference(s) SO23-12-9, 12-1 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 23121 (As available)

Question Source: Bank # N56816  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X  
55.43 X

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>3</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>G2.1.1</u>	<u>          </u>
	Importance Rating	<u>3.7</u>	<u>          </u>

Knowledge of conduct of operations requirements.

Proposed Question: Common 66

You are a licensed Reactor Operator and have been assigned to an administrative function.

- You are current in maintaining qualification in the Licensed Operator Requalification Program.
- The date is October 15, 2006 and you are preparing to return to shift duties.

The time you were on shift since this assignment is as follows:

- 12 hours on September 24, 2006 as the 22 Watch.
- 12 hours on September 23, 2006 as the 22 Watch.
- 12 hours on August 22, 2006 as the 22 Watch.
- 12 hours on June 19, 2006 as the 21 Watch.
- 12 hours on June 18, 2006 as the 21 Watch.

Which ONE (1) of the following describes the status of your license proficiency?

- Your license is active. You may stand watch with no restrictions.
- Your license is active. You must regain qualification as RO by standing three (3) additional 12 hour shifts in the 21 OR 31 Watch position.
- Your license is inactive. You must reactivate your license by standing 40 hours under instruction in the 21 OR 31 Watch position ONLY.
- Your license is inactive. You must reactivate your license by standing 40 hours under instruction as either 21, 22, 31, OR 32 Watch.

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. License is inactive due to insufficient hours last quarter.
- B. Incorrect. Proficiency is not based on board position.
- C. Incorrect. May regain proficiency in either position.
- D. Correct. Last calendar quarter did not stand 5 shifts.

Technical Reference(s): 10CFR55.53(e)(f)2 (Attach if not previously provided)  
SO123-0-A1

Proposed references to be provided to applicants during examination: None

Learning Objective: NONE (As available)

Question Source: Bank # \_\_\_\_\_  
 Modified Bank # X (Note changes or attach parent)  
 New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
 Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 X  
 55.43 \_\_\_\_\_

Comments:

Robinson 2004 Audit exam - Western Tech Bank Archive

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>3</u>	<u>          </u>
	Group #	<u>1</u>	<u>          </u>
	K/A #	<u>G2.1.22</u>	<u>          </u>
	Importance Rating	<u>2.8</u>	<u>          </u>

Ability to determine Mode of Operation.

Proposed Question: Common 67

What MODE of operation would the Unit be in if the reactivity condition is 0.95 K-eff and average Reactor Coolant temperature is 360°F?

- A. Mode 2 – Startup
- B. Mode 3 – Hot Standby
- C. Mode 4 – Hot Shutdown
- D. Mode 5 – Cold Shutdown

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. Temperature would be higher with a higher Keff and RTCBs closed
- B. Correct. Temperature above 350
- C. Incorrect. Temperature below 350
- D. Incorrect. Temperature must be less than 200

Technical Reference(s): [TS section 1, table 1.1-1](#) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 19557 (As available)

Question Source: Bank # X  
 Modified Bank #            (Note changes or attach parent)  
 New

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge   X    
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41   X    
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>3</u>	<u>          </u>
	Group #	<u>2</u>	<u>          </u>
	K/A #	<u>G2.2.34</u>	<u>          </u>
	Importance Rating	<u>2.8</u>	<u>          </u>

Knowledge of the process for determining the internal and external effects on core reactivity.

Proposed Question: Common 68

Given the following conditions:

- A reactor startup is being performed 20 hours after a trip from 100% power.
- Estimated Critical CEA Position is Reg. Group 5 at 60 inches.
- Criticality is predicted in 5 hours.

If the startup were to proceed 1/2 hour earlier than scheduled, what is the effect on the 1/M plot data taken during the startup?

1/M plot will....

- accurately predict criticality at a lower CEA position.
- accurately predict criticality at a higher CEA position.
- inaccurately predict criticality in a conservative direction.
- inaccurately predict criticality in a non-conservative direction.

Proposed Answer: B

Explanation (Optional):

- Incorrect. Would predict at a higher CEA position, because ½ less hour of Xenon removal adds less positive reactivity, requiring more positive reactivity from CEAs for criticality
- Correct.
- Incorrect. 1/M should always be accurate. ECP may be inaccurate
- Incorrect. 1/M should always be accurate

Technical Reference(s): Xenon Curves (Attach if not previously provided)  
SO23-3-1.1

Proposed references to be provided to applicants during examination: NoneLearning Objective: 21492 (As available)Question Source: Bank # \_\_\_\_\_  
Modified Bank # X (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X10 CFR Part 55 Content: 55.41 X  
55.43 \_\_\_\_\_Comments:  
WTSI Bank Mod

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>3</u>	<u>          </u>
	Group #	<u>2</u>	<u>          </u>
	K/A #	<u>G2.2.12</u>	<u>          </u>
	Importance Rating	<u>3.0</u>	<u>          </u>

Knowledge of surveillance procedures.

Proposed Question: Common 69

A Post Maintenance Test is being performed to return a piece of equipment to service.

A portion of a Surveillance Procedure contains steps that may be used to satisfy the retest requirements.

Which ONE (1) of the following describes a requirement for partial use of the surveillance?

- A. A 10CFR50.59 screening must be performed.
- B. A Procedure Modification Permit must be initiated.
- C. The specific steps of the surveillance that will be performed must be identified in the Operability Verification block of the Prerequisites.
- D. All steps of the surveillance that will NOT be performed must be marked N/A and initialed by the SRO approving the retest.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Only for change of intent
- B. Incorrect. PMP not required for this use
- C. Correct.
- D. Incorrect. Steps may be NA but SRO not required to sign

Technical Reference(s) [SO123-0-A3, 6.2.12](#) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 6746 (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New  X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge  X   
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41  X   
\_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>3</u>	<u>          </u>
	Group #	<u>2</u>	<u>          </u>
	K/A #	<u>G2.2.1</u>	<u>          </u>
	Importance Rating	<u>3.7</u>	<u>          </u>

Ability to perform pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity.

Proposed Question:           Common 70

During a Reactor Startup with a positive (+) ITC (isothermal temperature coefficient), reactor power is rising.

Which ONE (1) of the following describes the preferred way to stabilize power?

- A.    Increase steaming.
- B.    Decrease steaming.
- C.    Initiate RCS boration.
- D.    Insert CEAs as necessary.

Proposed Answer:           D

Explanation (Optional):

- A.    Incorrect. Secondary control, would cause power to lower, but would decrease SDM
- B.    Incorrect. Would cause power to rise
- C.    Incorrect. Not during a startup to level power
- D.    Correct. With a positive ITC, do NOT let the secondary plant control reactivity. Maintain control with CEAs

Technical Reference(s)    [SO23-5-1.3.1](#)                   (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective:       23483                   (As available)

Question Source:         Bank #           N1628

Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge   X    
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41   X    
\_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>3</u>	<u>          </u>
	Group #	<u>2</u>	<u>          </u>
	K/A #	<u>G2.2.2</u>	<u>          </u>
	Importance Rating	<u>4.0</u>	<u>          </u>

Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels.

Proposed Question:           Common 71

A load increase is being performed in accordance with SO23-5-1.7, Power Operation.

Which ONE (1) of the following describes the preferred sequence of ASI control as power is raised above 50% power?

- A.    PLCEAs, Group 5, Group 6.
- B.    Group 5, Group 6, PLCEAs.
- C.    Group 6, Group 5, PLCEAs.
- D.    PLCEAs, Group 6, Group 5.

Proposed Answer:           D

Explanation (Optional):

- A.    Incorrect. Groups 5 and 6 are out of order
- B.    Incorrect. Wrong order-opposite
- C.    Incorrect. Wrong order
- D.    Correct.

Technical Reference(s)    [SO23-5-1.7](#)                   (Attach if not previously provided)

\_\_\_\_\_

Proposed references to be provided to applicants during examination: None

Learning Objective:       231599 analysis node           (As available)

Question Source:           Bank #           N1692  
                                   Modified Bank #                        (Note changes or attach parent)  
                                   New

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge   X    
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41   X    
\_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>3</u>	<u>          </u>
	Group #	<u>3</u>	<u>          </u>
	K/A #	<u>G2.3.9</u>	<u>          </u>
	Importance Rating	<u>2.5</u>	<u>          </u>

Knowledge of the process for performing a containment purge.

Proposed Question: Common 72

Given the following conditions:

- Unit 2 is in Mode 5.
- Containment Purge was stopped briefly for a filter change-out on 2RE-7828.
- The CRS has verified that the Release Permit is still valid.

Which ONE (1) of the following describes the FIRST action necessary to restart the Containment Purge in accordance with SO23-1-4.2, Containment Purge and Recirculation Filtration System?

- A. Open Purge Exhaust Unit Isolation Valves, 2HV-9950 and 2HV-9951.
- B. Open Purge Supply Unit Isolation Valves 2HV-9948 and 2HV-9949.
- C. Ensure the Containment Radiation Monitor, 2RE-7828, is reset.
- D. Start the Main Purge Exhaust Unit, 2MA-60.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect.
- B. Incorrect.
- C. Correct. All of the other actions above are performed, but after the radiation monitor is reset
- D. Incorrect.

Technical Reference(s) SO23-1-4.2, Section 6.3 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 219918 analysis node (As available)

Question Source: Bank # X  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 X  
\_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>3</u>	<u>          </u>
	Group #	<u>3</u>	<u>          </u>
	K/A #	<u>G2.3.11</u>	<u>          </u>
	Importance Rating	<u>2.7</u>	<u>          </u>

Ability to control radiation releases.

Proposed Question: Common 73

Unit 2 was operating at 100% power when a SG tube rupture occurred on E-089.

Which ONE (1) of the following describes the preferred method of cooling down the RCS to Mode 5?

- A. Dump steam to the condenser using the E-088 SG ONLY to minimize radiological releases.
- B. Dump steam through the E-088 SG's ADVs ONLY to minimize contamination of the secondary system for ALARA reasons.
- C. Dump steam through the E-088 AND E-089 SG's ADVs to minimize contamination of the secondary system for ALARA reasons.
- D. Dump steam to the condenser using the E-088 AND E-089 SGs to minimize radiological releases.

Proposed Answer: A

Explanation (Optional):

- A. Correct.
- B. Incorrect. If condenser is available, would conserve secondary inventory to use condenser
- C. Incorrect. Do not use E089 if you don't have to, and not to atmosphere
- D. Incorrect. Do not use E089 if you don't have to.

Technical Reference(s) SO23-12-4 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 22685 (As available)

Question Source: Bank # X

Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge   X    
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41   X    
\_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>3</u>	<u>          </u>
	Group #	<u>4</u>	<u>          </u>
	K/A #	<u>G2.4.18</u>	<u>          </u>
	Importance Rating	<u>2.7</u>	<u>          </u>

Knowledge of the specific bases for EOPs.

Proposed Question: Common 74

What is the basis for the step in EOI SO23-12-6, Loss of Feedwater that requires the operators to ensure all RCPs are stopped?

- A. Prevent over pressurizing the RCS as pressurizer level rises.
- B. Reduce mass flow rate through the steam generators to maintain tube integrity.
- C. Prevent operating RCPs without adequate NPSH, due to RCS heatup.
- D. Extend time to SG dryout by limiting heat input into the RCS.

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. Pressure will rise for event, but not reason for pump trip
- B. Incorrect. Flow will be reduced, but tube integrity is a concern for reinitiation of feed
- C. Incorrect. NPSH will be reduced, but not enough to require tripping
- D. Correct.

Technical Reference(s) [SO23-14-6, Att. 1, Section 4.4.4](#) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 6914 (As available)

Question Source: Bank # 4111  
 Modified Bank #            (Note changes or attach parent)  
 New           

Question History: Last NRC Exam

Question Cognitive Level: Memory or Fundamental Knowledge   X    
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41   X    
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	<u>3</u>	<u>          </u>
	Group #	<u>4</u>	<u>          </u>
	K/A #	<u>G2.4.11</u>	<u>          </u>
	Importance Rating	<u>3.4</u>	<u>          </u>

Knowledge of abnormal condition procedures.

Proposed Question: Common 75

The plant is in Mode 1 when an event occurs requiring the use of an Abnormal Operating Instruction (AOI).

Due to plant conditions, not all of the steps directed by the AOI are applicable.

Which ONE (1) of the following actions should be taken?

- A. Log the steps NOT performed in the Control Operators Log.
- B. Initial the steps NOT performed and explain with comments.
- C. Mark the steps NOT performed as N/A and continue with the AOI.
- D. Pass over the steps and frequently recheck the steps NOT performed.

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. Log would be used to document activities, but not steps that weren't performed in AOI
- B. Incorrect. Would normally initial steps performed. No explanation
- C. Incorrect. Would perform for non-AOI situations
- D. Correct. Direct from procedure.

Technical Reference(s) SO123-0-A3 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 23411 (As available)

Question Source: Bank # X  
Modified Bank #            (Note changes or attach parent)

New

\_\_\_\_\_  
\_\_\_\_\_

Question History:

Last NRC Exam

\_\_\_\_\_

Question Cognitive Level:

Memory or Fundamental Knowledge  
Comprehension or Analysis

X \_\_\_\_\_  
\_\_\_\_\_

10 CFR Part 55 Content:

55.41 X  
55.43 \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>1</u>
	Group #	_____	<u>1</u>
	K/A #	<u>022 AA2.01</u>	_____
	Importance Rating	_____	<u>3.8</u>

Ability to determine and interpret the following as they apply to the Loss of Reactor Coolant Makeup: Whether charging line leak exists.

Proposed Question: SRO 76

Given the following conditions:

- The plant is at 100% power.
- Two (2) Charging Pumps are operating.
- Letdown flow is 0 GPM.
- VCT Level is 41% and lowering at 4% per minute.
- Pressurizer level is 51% and lowering slowly.
- CFMS page 122, Ctmt Sump Tank 30 minute flow indicates 156 GPM.
- TI-0221 and TI-9267, Regenerative Heat Exchanger Outlet Temperature, is 350°F and rising.
- Containment humidity is rising.
- RCS Temperature is 547°F and stable.

Which ONE (1) of the following describes the event in progress and the action required?

- A. Letdown line leak. Isolate Letdown in accordance with SO23-13-14, Reactor Coolant Leak AOI.
- B. Charging line leak. Isolate Letdown in accordance with SO23-13-14, Reactor Coolant Leak AOI.
- C. Letdown line leak. Trip the reactor and enter SO23-12-1, SPTAs.
- D. Charging line leak. Trip the reactor and enter SO23-12-1, SPTAs.

Proposed Answer: A

Explanation (Optional):

- A. Correct.
- B. Incorrect. With RHX temp rising, letdown is ruptured. Charging would be the leak if RHX temp was lowering
- C. Incorrect. Reactor Trip is not required for the current condition
- D. Incorrect. Leak in letdown, not charging

KA Match: The applicant must determine whether a charging line leak exists. In this case, the leak is in the letdown line, but the applicant is required to determine whether it is in the charging line, because the distractors distinguish between the 2 events..

Technical Reference(s): SO23-13-14 (Attach if not previously provided)

\_\_\_\_\_

Proposed references to be provided to applicants during examination: None

Learning Objective: 20741 (As available)

Question Source: Bank # \_\_\_\_\_

Modified Bank # X (Note changes or attach parent)

New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 \_\_\_\_\_

55.43 5

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	1
	Group #	_____	1
	K/A #	027 G2.1.23	
	Importance Rating	_____	4.0

Conduct of Operations: Ability to perform specific and integrated plant procedures during all modes of plant operation

Proposed Question: SRO 77

Given the following conditions:

- Unit 3 is at 100% power.
- PV-0100A, PZR Spray Valve from Loop A, is open approximately 40%.
- RCS pressure is 2200 psia and trending down at 10 psi per minute.

(1) Which ONE (1) of the Technical Specification Safety Limits may be challenged by this event, and (2) which of the following actions is required?

- A. (1) Linear Heat Rate Safety Limit  
(2) Trip the reactor; enter SO23-12-1, SPTAs; trip the RCPs in Loop A when Reactivity Control is verified.
- B. (1) Linear Heat Rate Safety Limit  
(2) Attempt to close the Spray Valve in accordance with AOI SO23-13-27, Pressurizer Pressure and Level Control Malfunction.
- C. (1) DNBR Safety Limit  
(2) Attempt to close the Spray Valve in accordance with AOI SO23-13-27, Pressurizer Pressure and Level Control Malfunction.
- D. (1) DNBR Safety Limit  
(2) Trip the reactor; enter SO23-12-1, SPTAs; trip all RCPs when Reactivity Control is verified.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. LHR limit challenged by CEA problems. Action would be alternate in case initial action did not work
- B. Incorrect. LHR limit challenged by CEA problems

- C. Correct.  
D. Incorrect. Action not required until initial action is unsuccessful

Technical Reference(s) SO23-13-27, TS section 2 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 19443 (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43 X

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>1</u>
	Group #	_____	<u>1</u>
	K/A #	<u>055 EA2.04</u>	
	Importance Rating	_____	<u>4.1</u>

Ability to determine or interpret the following as they apply to a Station Blackout: Instruments and controls operable with only dc battery power available.

Proposed Question: SRO 78

Following a Station Blackout on Unit 2, the Emergency Diesel Generator (EDG) 2G002 remains shutdown and offsite power has been RESTORED to the Reserve Auxiliary Transformers.

Which ONE (1) of the following **MUST** be performed in order to energize 1E 4 kV bus 2A04 from the Reserve Auxiliary Transformer?

- A. Open Bus 2A04 knife-switches 127F1 through 127F4 in accordance with SO23-12-11, EOI Supporting Attachments.
- B. Open Bus 2A04 knife-switches 127F1 through 127F4 in accordance with SO23-12-7, Loss of Off-Site/Loss of Forced Circulation.
- C. Open the 50.54XA1, B1, A2, and B2 switches in accordance with SO23-12-11, EOI Supporting Attachments.
- D. Open the 50.54XA1, B1, A2, and B2 switches in accordance with SO23-12-7, Loss of Off-Site/Loss of Forced Circulation.

Proposed Answer: A

Explanation (Optional):

- A. Correct.
- B. Incorrect. Correct action using incorrect procedure
- C. Incorrect. Incorrect switch using correct procedure
- D. Incorrect. Incorrect switch using incorrect procedure

Technical Reference(s) SO23-12-8 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 22765 (As available)



Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>1</u>
	Group #	_____	<u>1</u>
	K/A #	<u>057 AA2.06</u>	
	Importance Rating	_____	<u>3.7</u>

Ability to determine and interpret the following as they apply to the Loss of Vital AC Instrument Bus: AC instrument bus alarms for the inverter and alternate power source.

Proposed Question: SRO 79

Given the following conditions:

- Unit 3 is at 100% power.
- The following alarms are received on CR57:
  - VITAL BUS 1 INVERTER FAILURE
  - Y01 INVERTER TROUBLE
- Lumigraphs for Channel 1 instrumentation indicate failed.
- DC BUS TROUBLE alarms are NOT lit.

Which ONE (1) of the following describes the time allowed to take action to restore the Vital Bus in accordance with Technical Specifications?

- A. 1 hour
- B. 2 hours
- C. 4 hours
- D. 8 hours

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. TS requires 2 hours
- B. Correct.
- C. Incorrect.
- D. Incorrect.

Technical Reference(s) SO23-13-18 (Attach if not previously provided)  
\_\_\_\_\_

Proposed references to be provided to applicants during examination: None

Learning Objective: 22761 (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43 X

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>1</u>
	Group #	_____	<u>1</u>
	K/A #	<u>E02 G2.1.2</u>	
	Importance Rating	_____	<u>4.0</u>

Conduct of Operations: Knowledge of operator responsibilities during all modes of plant operation.

Proposed Question: SRO 80

The Reactor has tripped and four (4) Full-length CEAs are stuck out.

After opening the Reactor Trip circuit breakers locally, two (2) CEAs fall in. Reactor power is lowering and startup rate is negative.

What are the proper actions by the operating crew in response to this event?

- A. Emergency borate the RCS, and immediately go to SO23-12-9, Functional Recovery.
- B. Emergency borate the RCS, and immediately go to the SO23-12-2, Reactor Trip Recovery.
- C. Emergency borate the RCS, finish the Standard Post Trip Actions, and diagnose a Functional Recovery entry.
- D. Emergency borate the RCS, finish the Standard Post Trip Actions, and diagnose a Reactor Trip Recovery event.

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. Reactivity control is satisfied if a boration is in progress. Immediate transition not called for in SPTAs
- B. Incorrect. Immediate transition not required. Complete SPTAs
- C. Incorrect. Reactivity Control is satisfied
- D. Correct.

Technical Reference(s) [EOI SO23-12-1](#) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 22484 (As available)

Question Source: Bank #   X    
Modified Bank #            (Note changes or attach parent)  
New           

Question History: Last NRC Exam   April 2005  

Question Cognitive Level: Memory or Fundamental Knowledge             
Comprehension or Analysis   X  

10 CFR Part 55 Content: 55.41             
55.43   X  

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>1</u>
	Group #	_____	<u>1</u>
	K/A #	<u>E05 G2.4.31</u>	
	Importance Rating	_____	<u>3.4</u>

Emergency Procedures / Plan Knowledge of annunciators, alarms, and indications, and use of the response instructions.

Proposed Question: SRO 81

Given the following conditions:

- Unit 2 is operating in Mode 1.
- Pre-Trip alarms are received on all 4 PPS channels for the following:
  - DNBR
  - LPD
  - Linear Power
- Turbine load is lowering slightly.
- Tcold is 4 degrees below program and trending down.
- Power is 104% and trending up slowly.

Which ONE (1) of the following is occurring, and which action is currently required to lower reactor power?

- A. Inadvertent RCS dilution; lower turbine load in accordance with the annunciator response procedures.
- B. Inadvertent RCS dilution; insert CEAs in accordance with SO23-5-1.7, Power Operations.
- C. ESDE; lower turbine load in accordance with the annunciator response procedures.
- D. ESDE; insert CEAs in accordance with SO23-5-1.7, Power Operations.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Indication is for ESDE, although actions are correct
- B. Incorrect. Indication is for ESDE. If inadvertent dilution, could insert CEAs to control

- C. Correct.  
D. Incorrect. For ESEDE, inserting CEAs would jeopardize SDM

Technical Reference(s) Need Ref (Attach if not previously provided)  
\_\_\_\_\_

Proposed references to be provided to applicants during examination: None

Learning Objective: 22973 (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43 X

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	1
	Group #	_____	2
	K/A #	005 G2.1.12	
	Importance Rating	3.3	_____

Conduct of Operations: Ability to apply technical specifications for a system

Proposed Question: SRO 82

The following conditions exist:

- Unit 2 is at 65 % power.
- CEA #20 was dropped.
- Recovery is in progress.
- Group 6 is at 149 inches withdrawn.
- CEA # 20 (a Group 6 CEA) is at 100 inches withdrawn.
- CEA # 1 (a Group 2 CEA) drops into the core, indicating 6 inches withdrawn.

Which ONE (1) of the following describes the impact of this condition and the correct required action(s)?

- A. Power peaking limits may be exceeded if the conditions are allowed to continue. Continue realigning CEA # 20, then align CEA # 1 with their respective groups in accordance with SO23-13-13, Misaligned or Immovable Control Element Assembly.
- B. Shutdown Margin requirements CANNOT be met in this condition. Realign CEA # 1, then continue aligning CEA # 20 with their respective groups in accordance with SO23-13-13, Misaligned or Immovable Control Element Assembly.
- C. Power peaking limits may be exceeded if the conditions are allowed to continue. Manually trip the reactor and enter SO23-12-1, Standard Post Trip Actions.
- D. Shutdown Margin requirements CANNOT be met in this condition. Initiate a rapid downpower in accordance with SO23-5-1.7, Power Operations.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. More than 1 CEA misaligned requires a reactor trip
- B. Incorrect. More than 1 CEA does not have to be dropped, only misaligned, to require a reactor trip
- C. Correct.
- D. Incorrect. Correct action for 1 CEA misaligned

Technical Reference(s): SO23-13-13 (Attach if not previously provided)  
 \_\_\_\_\_  
 \_\_\_\_\_

Proposed references to be provided to applicants during examination: None

Learning Objective: 23436 (As available)

Question Source: Bank # X  
 Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
 New \_\_\_\_\_

Question History: Last NRC Exam YES

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
 Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
 55.43 X

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>1</u>
	Group #	_____	<u>2</u>
	K/A #	<u>A11 G2.1.2</u>	
	Importance Rating	_____	<u>4.0</u>

Conduct of Operations: Knowledge of operator responsibilities during all modes of plant operation.

Proposed Question: SRO 83

Given the following:

- A Reactor trip has occurred.
- The crew is implementing SO23-12-2, Reactor Trip Recovery.
- RCS pressure is 2150 psia and stable.
- RCS temperature is 538°F and lowering.
- SG E089 NR level is 82% and rising.
- SG E088 NR level is 62% and rising.
- All other indications are normal.
- SG level setpoint has been lowered to 55% in both SGs.

Which ONE (1) of the following actions is required?

- A. Remain in SO23-12-2. Lower feed flow rate and steaming rate to stabilize RCS temperature.
- B. Trip RCPs due to loss of NPSH in accordance with SO23-12-2, and enter SO23-12-7, Loss of Off-Site Power/Loss of Forced Circulation.
- C. Exit SO23-12-2, rediagnose the event, and enter SO23-12-4, Steam Generator Tube Rupture.
- D. Exit SO23-12-2 and go to SO23-12-9 based on RCS Pressure Control Safety Function not being met.

Proposed Answer: A

Explanation (Optional):

- A. Correct. Setpoint established, so control is manual
- B. Incorrect. NPSH not lost, just RCS temperature lowering. Correct procedure entry if that action was required
- C. Incorrect. Overfeeding is indicated. SGTR not indicated due to radiation levels normal
- D. Incorrect. Pressure Control is out of normal, but Safety Function would be met because

pressure is stable

Technical Reference(s) SO23-12-2 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 22768 (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43 X

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>1</u>
	Group #	_____	<u>2</u>
	K/A #	<u>A13 AA2.2</u>	_____
	Importance Rating	_____	<u>3.8</u>

Ability to determine and interpret the following as they apply to the (Natural Circulation Operations) Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.

Proposed Question: SRO 84

Given the following:

- Unit 2 was tripped 30 minutes ago.
- The crew is performing actions of SO23-12-3, Loss of Coolant Accident.
- RCS temperature is 525°F.
- RCS pressure is 1050 psia.
- Power has been lost to the entire switchyard.
- 1E power is being supplied by the diesel generators.
- Voids have formed in the head.

Which ONE (1) of the following actions will be performed to promote cooling of the reactor vessel head thus assisting with void elimination?

- A. Raising then lowering RCS pressure and pressurizer level in accordance with FS-10, Eliminate Voids.
- B. Venting the pressurizer in accordance with SO23-12-11, Attachment 15, Void Compensation.
- C. Starting a reactor coolant pump in accordance with FS-10, Eliminate Voids.
- D. Starting a CEDM Cooling Fan in accordance with SO23-12-11, Attachment 15, Void Compensation.

Proposed Answer: A

Explanation (Optional):

- A. Correct.
- B. Incorrect. Action would be required for reducing non condensable voids. Not required for these conditions
- C. Incorrect. No power available
- D. Incorrect. No power available

Technical Reference(s) FS-10 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 23523 (As available)

Question Source: Bank # N8280  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43 X

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>1</u>
	Group #	_____	<u>2</u>
	K/A #	<u>E09 EA2.2</u>	
	Importance Rating	_____	<u>4.0</u>

Ability to determine and interpret the following as they apply to the (Functional Recovery) Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.

Proposed Question: SRO 85

Given the following:

- SO23-12-9, Functional Recovery is being implemented.
- Heat Removal has failed HR-1.
- The STA reports Vital Auxiliaries no longer meets any success path.

Which ONE (1) of the following mitigating steps will be performed by the CRS FIRST?

- Implement FR-2, RECOVERY – VITAL AUXILIARIES.
- Implement FR-5, RECOVERY – HEAT REMOVAL.
- Reevaluate the event in accordance with Attachment SF-1, RECOVERY DIAGNOSTIC.
- Implement Success Path HR-2, ECCS + SG.

Proposed Answer: A

Explanation (Optional):

- Correct.
- Incorrect. VA is not satisfied, and higher priority
- Incorrect. Just follow the SFSC hierarchy
- Incorrect. Will implement after going to VA first

Technical Reference(s) SO23-12-9 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 22546 (As available)

Question Source: Bank # N8402  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X \_\_\_\_\_

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43 X \_\_\_\_\_

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>2</u>
	Group #	_____	<u>1</u>
	K/A #	<u>003 G2.1.23</u>	
	Importance Rating	_____	<u>4.0</u>

Conduct of Operations: Ability to perform specific system and integrated plant procedures during all modes of plant operation.

Proposed Question: SRO 86

The following annunciators are received in the control room:

- 56C24, RCP P001 SEAL PRESS HI/LO
- 56B57, RCP BLEEDOFF FLOW HI/LO

The CO determines the following for RCP P001:

- Middle seal cavity pressure = 2238 psia
- Upper seal cavity pressure = 2150 psia
- Vapor seal cavity pressure = 2080 psia

Which ONE (1) of the following describes the action required?

- Trip the reactor and enter SO23-12-1, SPTAs. Stop RCP P001 after the reactor is tripped and CEAs have been inserted for 5 seconds.
- Isolate Seal Bleedoff to establish a boundary for the RCP seal and initiate an Engineering evaluation for continued operation of the RCP in accordance with AOI SO23-13-6, Reactor Coolant Pump Seal Failure.
- Initiate a Plant Shutdown to Hot Standby in accordance with SO23-5-1.4, Plant Shutdown to Hot Standby. Stop RCP P001 after the reactor is tripped and CEAs have been inserted for 5 seconds.
- Initiate a Rapid Shutdown to Hot Standby in accordance with SO23-5-1.7, Power Operations. Stop RCP P001 after the reactor is tripped and CEAs have been inserted for 5 seconds.

Proposed Answer: A

Explanation (Optional):

- Correct. <100 psig DP through each seal means they are failed
- Incorrect. Evaluation would be performed for degraded seals, not seal failures. Action determined by AOI

- C. Incorrect. Trip required for failure of 3 seals
- D. Incorrect. More than 2 seals have failed

Technical Reference(s) SO23-13-6 (Attach if not previously provided)  
\_\_\_\_\_

Proposed references to be provided to applicants during examination: None

Learning Objective: 19637 (As available)

Question Source: Bank # \_\_\_\_\_  
 Modified Bank # X (Note changes or attach parent)  
 New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
 Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
 55.43 X

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>2</u>
	Group #	_____	<u>1</u>
	K/A #	<u>013 A2.02</u>	_____
	Importance Rating	_____	<u>4.5</u>

Ability to (a) predict the impacts of the following malfunctions or operations on the ESFAS; and (b) based Ability on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations; Excess steam demand.

Proposed Question: SRO 87

Given the following conditions:

- An EFAS actuation has occurred.
- SG E-089 Level = 15% NR.
- SG E-089 Pressure = 570 psia and lowering.
- SG E-088 Level = 20% NR.
- SG E-088 Pressure = 710 psia and lowering.
- NO action has been taken by the crew.

Which ONE (1) of the following describes the automatic operation of the EFAS System and actions that will be required to mitigate the event in progress?

- AFW is feeding SG E-089 ONLY. Override and initiate AFW flow to SG E-088 in accordance with SO23-12-2, Reactor Trip Recovery
- AFW is feeding SG E-088 ONLY. Override and initiate AFW flow to SG E-089 in accordance with SO23-12-2, Reactor Trip Recovery.
- AFW is feeding SG E-089 ONLY. Event mitigation will be in accordance with Floating Step 30, Establish Stable RCS Temperature During ESDE.
- AFW is feeding SG E-088 ONLY. Event mitigation will be in accordance with Floating Step 30, Establish Stable RCS Temperature During ESDE.

Proposed Answer: D

Explanation (Optional):

- Incorrect. E089 has the lower pressure, will not be fed
- Incorrect. Do not override because there is an ESDE on E089
- Incorrect. Wrong SG, correct strategy
- Correct.

Technical Reference(s) FS-29 (Attach if not previously provided)  
\_\_\_\_\_

Proposed references to be provided to applicants during examination: None

Learning Objective: 22738 (As available)

Question Source: Bank # X  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43 X

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>2</u>
	Group #	_____	<u>1</u>
	K/A #	<u>026 A2.03</u>	_____
	Importance Rating	_____	<u>4.1</u>

Ability to (a) predict the impacts of the following malfunctions or operations on the CSS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Failure of ESF

Proposed Question: SRO 88

Given the following conditions:

- A reactor trip has occurred on Unit 3.
- Bus 3A06 has an overcurrent lockout.
- RCS pressure is 1200 psia and lowering.
- Containment Pressure is 16 psig and rising.
- Containment radiation levels are rising.
- All required ESF actuation signals have initiated.
- Containment Spray flow is 0 GPM on each Train.
- The crew is performing the SPTA diagnostic action.

Which ONE (1) of the following describes the event diagnosis and action required upon transition from SO23 12-1, SPTAs?

- A. Go to SO23-12-9, Functional Recovery, due to Containment Isolation Safety Function not being met.
- B. Go to SO23-12-9, Functional Recovery, due to Containment Temperature and Pressure Control not being met.
- C. Diagnose LOCA, enter SO23-12-3, and transition to SO23-12-9 upon recognition of Containment Isolation SFSC criteria not being met.
- D. Diagnose LOCA, enter SO23-12-3, and transition to SO23-12-9 upon recognition of Containment Temperature and Pressure Control SFSC criteria not being met.

Proposed Answer: D

Explanation (Optional):

- A. Incorrect. Incorrect action for going to 12-9 from SPTAs
- B. Incorrect. Incorrect action to transition from SPTAs

- C. Incorrect. Correct transition, but wrong safety function
- D. Correct.

Technical Reference(s) EOI 12-1, 12-3, 12-9 (Attach if not previously provided)

\_\_\_\_\_

Proposed references to be provided to applicants during examination: None

Learning Objective: 22741 (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43 X

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>2</u>
	Group #	_____	<u>1</u>
	K/A #	<u>062 A2.05</u>	_____
	Importance Rating	_____	<u>3.3</u>

Ability to (a) predict the impacts of the following malfunctions or operations on the ac distribution system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Methods for re-energizing a dead bus.

Proposed Question: SRO 89

Given the following conditions:

- Unit 2 is in a Station Blackout.
- Off-Site power is NOT available.
- BOTH EDGs have failed.
- 3A04 and 3A06 are energized by their EDGs.

Which ONE (1) of the following describes the action that may be performed based on these conditions?

- A. 2A04 and 2A06 may be supplied from Unit 3 DGs in accordance with SO23-12-11, Attachment 24, Supplying 1E 4KV Bus with Opposite Unit Diesel. No additional approval is required
- B. 2A04 and 2A06 may be supplied from Unit 3 DGs in accordance with SO23-12-11, Attachment 24, Supplying 1E 4KV Bus with Opposite Unit Diesel. 10CFR50.54(x) must be invoked to perform this action.
- C. 2A04 and 2A06 may NOT be supplied from Unit 3 DGs for this condition. Consider energizing 480 volt busses by performing SO23-12-11, Attachment 23, Cross-Connecting Class 1E 480 volt busses between Units. No additional approval is required.
- D. 2A04 and 2A06 may NOT be supplied from Unit 3 DGs for this condition. Consider energizing 480 volt busses by performing SO23-12-11, Attachment 23, Cross-Connecting Class 1E 480 volt busses between Units. 10CFR50.54(x) must be invoked to perform this action.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. Requires 50.54 (x) to perform this action
- B. Correct.
- C. Incorrect. May be supplied with permission. Action for 480 volt busses is correct but the 4kv busses may be crosstied
- D. Incorrect. First statement is incorrect. Remainder of option may be performed per procedure

Technical Reference(s) SO23-12-8 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 22321 (As available)

Question Source: Bank # \_\_\_\_\_

Modified Bank # \_\_\_\_\_ (Note changes or attach parent)

New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_

Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 \_\_\_\_\_

55.43 X

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>2</u>
	Group #	_____	<u>1</u>
	K/A #	<u>063 G2.4.6</u>	_____
	Importance Rating	_____	<u>4.0</u>

Emergency Procedures / Plan Knowledge symptom based EOP mitigation strategies.

Proposed Question: SRO 90

Given the following conditions:

- A Station Blackout has occurred on Unit 3.
- The crew is performing actions of SO23-12-8, Station Blackout.

Which ONE (1) of the following describes the priority for Non-Vital Bus energization, the reason why, and the action required for restoration?

- A. A08 is given priority; It supplies power directly to the MCC that supplies DC Bus D5 Battery Charger. Bus D5 supplies control power to align Non-Vital buses; A08 will be energized IAW SO23-12-11, Attachment 8, Restoration of Off-Site Power.
- B. A07 is given priority; it supplies power directly to the MCC that supplies DC Bus D6 Battery Charger. Bus D6 supplies control power to align Non-Vital buses; A07 will be energized IAW SO23-12-11, Attachment 8, Restoration of Off-Site Power.
- C. A08 is given priority; It supplies power directly to the MCC that supplies DC Bus D5 Battery Charger. Bus D5 supplies control power to align Non-Vital buses; A08 will be energized IAW SO23-6-2, Transferring of 4KV Buses.
- D. A07 is given priority; It supplies power directly to the MCC that supplies DC Bus D6 Battery Charger. Bus D6 supplies control power to align Non-Vital buses; A07 will be energized IAW SO23-6-2, Transferring of 4KV Buses.

Proposed Answer: A

Explanation (Optional):

- A. Correct.
- B. Incorrect. D6 does not supply the non-vital control power
- C. Incorrect. Wrong option for procedure selection

D. Incorrect. Wrong bus, wrong procedure

Technical Reference(s) SO23-12-8 (Attach if not previously provided)  
[Attachment 8](#)

Proposed references to be provided to applicants during examination: None

Learning Objective: 22765 (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43 X

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>2</u>
	Group #	_____	<u>2</u>
	K/A #	<u>001 A2.11</u>	
	Importance Rating	_____	<u>4.7</u>

Ability to (a) predict the impacts of the following malfunction or operations on the CRDS- and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Situations requiring a reactor trip.

Proposed Question: SRO 91

Given the following plant conditions:

- A Turbine Governor Valve has failed closed.
- The RO is inserting Regulating Group 6 CEAs to restore Tcold to the programmed band.
- Reg Group 6 is at 126 inches.
- It has been determined that a Group 6 CEA is stuck at 144 inches.

Which ONE (1) of the following actions is required?

- A. A reactor trip should have occurred. Trip the reactor; enter SO23-12-1, Standard Post Trip Actions.
- B. A reactor trip may occur if the condition is allowed to remain. Continue inserting Reg Group 6 CEAs until Tcold is on program. Enter SO23-13-13, determine if the stuck CEA is trippable, and verify Shutdown Margin within 1 hour.
- C. A reactor trip may occur if the condition is allowed to remain. Enter SO23-13-13, Misaligned or Immovable Control Element Assembly, and align CEAs or verify Shutdown Margin within 1 hour.
- D. A reactor trip should have occurred. Trip the reactor, enter SO23-12-1, and initiate Emergency Boration of the RCS per SO23-13-11 for the stuck CEA.

Proposed Answer: A

Explanation (Optional):

- A. Correct. One CEA with outward deviation > 9.7" results in a CEAC penalty factor that should cause a CPC reactor trip. Since the automatic trip did not occur, a manual trip is required.
- B. Incorrect. May perform if CEA wasn't more than 9.7 inches out
- C. Incorrect. Would perform for lesser alignment



Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>2</u>
	Group #	_____	<u>2</u>
	K/A #	<u>014 G2.1.32</u>	
	Importance Rating	_____	<u>3.8</u>

Conduct of Operations: Ability to explain and apply all system limits and precautions.

Proposed Question: SRO 92

Given the following:

- A plant startup is in progress.
- The unit is in Mode 3.
- Both CEACs are declared INOPERABLE.

Which ONE (1) of the following describes the action required in accordance with Technical Specifications?

- Suspend the startup and remain in Mode 3.
- Within 1 hour, verify that Shutdown Margin requirements are met. Startup may continue.
- Place the CEAC INOP flags in each CPC. Startup may continue.
- Enter and comply with the actions of TS LCO 3.0.3.

Proposed Answer: A

Explanation (Optional):

- Correct.
- Incorrect. Would not continue SU with 2 CEAC inop
- Incorrect. Placing CEAC inop flags does not allow startup to continue
- Incorrect. 3.0.3 will not apply for condition.

Technical Reference(s) SO23-3-2.12 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 19524 (As available)



Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>2</u>
	Group #	_____	<u>2</u>
	K/A #	<u>056 A2.04</u>	_____
	Importance Rating	_____	<u>2.8</u>

Ability to (a) predict the impacts of the following malfunctions or operations on the Condensate System; and (b) based on those predictions, use Procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of Condensate Pumps

Proposed Question: SRO 93

Given the following plant conditions:

- Unit 3 is initially operating at 95% power.
- Condensate Pumps P050, P051 and P052 are initially running.
- Condensate Pump P050 trips.
- Condensate Pump P-053 trips upon starting.
- NO action has been taken by the crew.

Which ONE (1) of the following describes the effect on the plant, and the action required?

- Main Feedwater Pump suction pressure will be maintained by 2 Heater Drain Pumps; determine the cause of the Condensate Pumps tripping in accordance with the applicable Annunciator Response Procedures.
- Main Feed Pump recirculation valves will throttle closed to raise suction pressure; enter SO23-13-24, Feedwater Control System Malfunctions, to verify the proper operation of the Feedwater System.
- Main Feed Pump recirculation valves will throttle closed to raise suction pressure; enter SO23-13-24, Feedwater Control System Malfunctions, to reduce load to within the capacity of the remaining Condensate Pumps.
- Main Feedwater Pumps will trip on low suction pressure; Trip the reactor and enter SO23-12-1, SPTAs.

Proposed Answer: D

Explanation (Optional):

- Incorrect. Need extra Condensate pump to remain on line
- Incorrect. If they are open, they will close. But action required will be to trip

- C. Incorrect. Load is too high to reduce it. Trip required  
D. Correct.

Technical Reference(s) SO23-13-24 (Attach if not previously provided)  
\_\_\_\_\_

Proposed references to be provided to applicants during examination: None

Learning Objective: 20056 (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43 X

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>3</u>
	Group #	_____	<u>1</u>
	K/A #	<u>G2.1.12</u>	_____
	Importance Rating	_____	<u>4.0</u>

Ability to apply technical specifications for a system.

Proposed Question: SRO 94

Given the following conditions:

- Unit 3 is in MODE 1. All systems are operating normally.
- The time is 1200 on September 30.
- LCO 3.0.3 has just been entered due to a common mode failure affecting both trains of SIAS.

Which ONE (1) of the times below is the LATEST time that the plant must be placed in MODE 4?

- A. 1800, September 30
- B. 1900, September 30
- C. 0000, October 1
- D. 0100, October 1

Proposed Answer: D

Explanation (Optional):

1 Hour to initiate, 7 hours to Hot Standby, 13 Hours to Hot Shutdown (Mode 4)

Technical Reference(s): TS 3.0.3 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 19550 (As available)

Question Source: Bank # X

Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New \_\_\_\_\_

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis  X

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43  X

Comments:  
Other facility

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>3</u>
	Group #	_____	<u>1</u>
	K/A #	<u>G2.1.5</u>	_____
	Importance Rating	_____	<u>3.4</u>

Ability to locate and use procedures and directives related to shift staffing and activities.

Proposed Question: SRO 95

Given the following:

- Unit 2 is in Mode 1.
- The shift is manned to the minimum composition per Appendix R.
- The shift has 4 hours remaining.
- The 21 Watch has become ill and must leave the site for emergency medical treatment.

Which ONE (1) of the following describes the requirements regarding the shift composition and required action in this situation?

- A. Responsibilities of the 21 Watch may be turned over to the 22 Watch for the remainder of the shift.
- B. The 21 Watch may NOT leave the site until minimum manning has been maintained by calling in a qualified relief.
- C. The 21 Watch may leave the site immediately after turnover of responsibilities to another qualified person on shift. A replacement must arrive within 2 hours.
- D. The CRS may assume the responsibilities of the 21 Watch. The Shift Manager may perform duties of CRS and SM concurrently until normal shift relief, as long as a qualified STA is on site.

Proposed Answer: C

Explanation (Optional):

- A. Incorrect. Too much time left on shift (4 hours)
- B. Incorrect. If there is an emergency, they may leave and position must be filled within 2 hours
- C. Correct.
- D. Incorrect. Max of 2 hours below minimum manning, although the crew may choose to assume responsibilities as they need to

Technical Reference(s): SO23-0-A1 (Attach if not previously provided)  
TS Section 5

Proposed references to be provided to applicants during examination: None

Learning Objective: 206841 analysis node (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43 2

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>3</u>
	Group #	_____	<u>2</u>
	K/A #	<u>G2.2.7</u>	_____
	Importance Rating	_____	<u>3.2</u>

Knowledge of the process for conducting tests or experiments not described in the safety analysis report.

Proposed Question: SRO 96

A Procedure Change is being initiated.

It has been determined that the change will result in procedure performance NOT in accordance with the UFSAR.

A 10CFR50.59 screening determined that a 10CFR50.59 evaluation is required.

Which ONE (1) of the following describes the MINIMUM approval authority required to perform the Procedure Change?

- A. Satisfactory completion of a 10CFR50.59 evaluation AND NRC approval prior to implementation.
- B. Satisfactory completion of a 10CFR50.59 evaluation prior to implementation only.
- C. Two SROs must review and approve the procedure change prior to implementation. A 10CFR50.59 evaluation must be performed within 24 hours.
- D. The Operations Manager must approve the procedure change, and a 10CFR50.59 evaluation must be performed within 24 hours.

Proposed Answer: B

Explanation (Optional):

- A. Incorrect. NRC approval not required.
- B. Correct.
- C. Incorrect. 50.59 prior to.... 2 SROs for normal procedure change
- D. Incorrect. 50.59 prior to.... Ops Mgr not required under this condition

Technical Reference(s) SO123-0-A3 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: NONE (As available)

Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge X  
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43 X

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>3</u>
	Group #	_____	<u>3</u>
	K/A #	<u>G2.3.8</u>	_____
	Importance Rating	_____	<u>3.2</u>

Knowledge of the process for performing a planned gaseous radioactive release.

Proposed Question: SRO 97

Given the following conditions:

- A Gaseous Waste release is planned for Unit 2.
- Wind direction is from the ocean.

Which ONE (1) of the following describes the status of the planned release in accordance with SO23-8-15, Gaseous Effluent Release?

The release...

- CANNOT be initiated until wind direction changes.
- may be initiated **ONLY IF** wind speed is below minimum required by a calculation.
- may be initiated **ONLY IF** wind speed is above the minimum required by a calculation.
- is DESIRABLE and may commence without restriction.

Proposed Answer: C

Explanation (Optional):

- Incorrect.
- Incorrect. Only requires one or the other
- Correct. Higher wind speed is higher dispersion factor
- Incorrect. Not desirable if wind is blowing towards land

Technical Reference(s): SO23-8-15 (Attach if not previously provided)

Proposed references to be provided to applicants during examination: None

Learning Objective: 20220 (As available)

Question Source: Bank # X  
Modified Bank #                      (Note changes or attach parent)  
New                     

Question History: Last NRC Exam                     

Question Cognitive Level: Memory or Fundamental Knowledge                       
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41                       
55.43 X

Comments:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>3</u>
	Group #	_____	<u>3</u>
	K/A #	<u>G2.3.3</u>	_____
	Importance Rating	_____	<u>2.9</u>

Knowledge of SRO responsibilities for auxiliary systems that are outside the control room (e.g., waste disposal and handling systems).

Proposed Question: SRO 98

Given the following conditions:

- Radwaste Secondary Tank T-057 is being released to the Unit 2 outfall.
- Liquid Radwaste Effluent Line Radiation Monitor, RE7813, indication becomes erratic, and then fails LOW.

Which ONE (1) of the following describes the actions required?

- Ensure the radwaste release is stopped. RE7813 must be declared OPERABLE prior to reinitiating the release.
- The release may continue as long as no High Radiation alarm was present prior to the radiation monitor failure, and the release permit calculations are still valid.
- Ensure the radwaste release is stopped. Two independent samples must be analyzed. Two technically qualified members of the facility staff must independently verify the release rate calculations and discharge line valving prior to reinitiating the release.
- The release may continue as long as dilution flow rate has not changed. Two independent samples must be analyzed. Two technically qualified members of the facility staff must independently verify the release rate calculations and discharge line valving within 4 hours.

Proposed Answer: C

Explanation (Optional):

- Incorrect. May release with inop monitor if compensatory actions are performed
- Incorrect. For monitor failure, may not know conditions of release prior to failure, so stop release
- Correct.
- Incorrect. Correct actions, but release must be stopped





Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge   X    
Comprehension or Analysis \_\_\_\_\_

10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43   X  

Comments:

10CFR55.43(b) item 5 because the SRO must assess the event and reportability, and determine the correct time to meet the NRC commitment.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	_____	<u>3</u>
	Group #	_____	<u>4</u>
	K/A #	<u>G2.4.32</u>	_____
	Importance Rating	_____	<u>3.5</u>

Knowledge of operator response to loss of all annunciators.

Proposed Question: SRO 100

Given the following conditions:

- Unit 3 is at 100% power.
- A loss of all Control Room Annunciators occurs.
- The crew has entered AOI SO23-13-22, Loss of Control Room Annunciators.
- The Shift Manager is determining potential event classification.

Which ONE (1) of the following additional actions is required within the first 15 minutes?

- Terminate activities that could disrupt plant stability in accordance with AOI SO23-13-22.
- Call out additional operators to intensify plant monitoring and assign additional compensatory actions (ACAs) in accordance with SO23-13-22.
- Initiate a power reduction to a lower stable power in accordance with SO23-5-1.7, Power Operations.
- Shut down the plant to Mode 3 in a steady controlled manner in accordance with SO23-5-1.4, Plant Shutdown to Hot Standby.

Proposed Answer: A

Explanation (Optional):

- Correct.
- Incorrect. Performed later at 1 hour
- Incorrect. May perform later at CRS/SM discretion
- Incorrect. May perform later at CRS/SM discretion

Technical Reference(s) [AOI SO23-13-22](#) (Attach if not previously provided)

Proposed references to be provided to applicants during examination: NoneLearning Objective: 9695 (As available)Question Source: Bank # \_\_\_\_\_  
Modified Bank # \_\_\_\_\_ (Note changes or attach parent)  
New X

Question History: Last NRC Exam \_\_\_\_\_

Question Cognitive Level: Memory or Fundamental Knowledge \_\_\_\_\_  
Comprehension or Analysis X10 CFR Part 55 Content: 55.41 \_\_\_\_\_  
55.43 X

Comments:

**U.S. Nuclear Regulatory Commission****Site-Specific RO-SRO Written Examination****Applicant Information**

Name:

Date:

Facility/Unit:

Region: I / II / III / IV

Reactor Type: W / CE / BW / GE

Start Time:

Finish Time:

**Instructions**

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. To pass the examination you must achieve a final grade of at least 80.00 percent overall, with a 70.00 percent or better on the SRO-only items if given in conjunction with the RO exam; SRO-only exams given alone require a final grade of 80.00 percent to pass. You have 8 hours to complete the combined examination, and 3 hours if you are only taking the SRO portion.

**Applicant Certification**

All work done on this examination is my own. I have neither given nor received aid.

\_\_\_\_\_

Applicant's Signature

**Results**

RO/SRO-Only/Total Examination Values \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ Points

Applicant's Score \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ Points

Applicant's Grade \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ Percent

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

1.	A	B	C	D	26.	A	B	C	D
2.	A	B	C	D	27.	A	B	C	D
3.	A	B	C	D	28.	A	B	C	D
4.	A	B	C	D	29.	A	B	C	D
5.	A	B	C	D	30.	A	B	C	D
6.	A	B	C	D	31.	A	B	C	D
7.	A	B	C	D	32.	A	B	C	D
8.	A	B	C	D	33.	A	B	C	D
9.	A	B	C	D	34.	A	B	C	D
10.	A	B	C	D	35.	A	B	C	D
11.	A	B	C	D	36.	A	B	C	D
12.	A	B	C	D	37.	A	B	C	D
13.	A	B	C	D	38.	A	B	C	D
14.	A	B	C	D	39.	A	B	C	D
15.	A	B	C	D	40.	A	B	C	D
16.	A	B	C	D	41.	A	B	C	D
17.	A	B	C	D	42.	A	B	C	D
18.	A	B	C	D	43.	A	B	C	D
19.	A	B	C	D	44.	A	B	C	D
20.	A	B	C	D	45.	A	B	C	D
21.	A	B	C	D	46.	A	B	C	D
22.	A	B	C	D	47.	A	B	C	D
23.	A	B	C	D	48.	A	B	C	D
24.	A	B	C	D	49.	A	B	C	D
25.	A	B	C	D	50.	A	B	C	D

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

51.	A	B	C	D	76.	A	B	C	D
52.	A	B	C	D	77.	A	B	C	D
53.	A	B	C	D	78.	A	B	C	D
54.	A	B	C	D	79.	A	B	C	D
55.	A	B	C	D	80.	A	B	C	D
56.	A	B	C	D	81.	A	B	C	D
57.	A	B	C	D	82.	A	B	C	D
58.	A	B	C	D	83.	A	B	C	D
59.	A	B	C	D	84.	A	B	C	D
60.	A	B	C	D	85.	A	B	C	D
61.	A	B	C	D	86.	A	B	C	D
62.	A	B	C	D	87.	A	B	C	D
63.	A	B	C	D	88.	A	B	C	D
64.	A	B	C	D	89.	A	B	C	D
65.	A	B	C	D	90.	A	B	C	D
66.	A	B	C	D	91.	A	B	C	D
67.	A	B	C	D	92.	A	B	C	D
68.	A	B	C	D	93.	A	B	C	D
69.	A	B	C	D	94.	A	B	C	D
70.	A	B	C	D	95.	A	B	C	D
71.	A	B	C	D	96.	A	B	C	D
72.	A	B	C	D	97.	A	B	C	D
73.	A	B	C	D	98.	A	B	C	D
74.	A	B	C	D	99.	A	B	C	D
75.	A	B	C	D	100.	A	B	C	D

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 001**

Which ONE (1) of the following describes the operation of the RCPs during a plant heatup from Cold Shutdown to Hot Standby and the reason for the operation?

The fourth RCP is started when...

- A. RCS temperature is greater than 500°F to ensure uniform heatup rates in the RCS.
- B. MODE 4 is entered, to limit core uplift caused by the high density of RCS fluid.
- C. MODE 4 is entered to ensure uniform heatup rates in the RCS.
- D. RCS temperature is greater than 400°F, to limit core uplift caused by the high density of RCS fluid.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 002**

Given the following conditions:

- Unit 2 is in MODE 5.
- Tcold is 160°F.
- RCS pressure is 320 psia.
- Pressurizer level is 20%.
- RCPs are SECURED.

Which ONE (1) of the following describes the restriction in place for starting an RCP, and the reason why?

- A. SG pressure must be less than 260 psia; to prevent overpressurizing the SGs.
- B. SG pressure must be greater than 260 psia; to prevent a reactivity excursion due to a cold water accident.
- C. SG temperature must be less than 260°F; to prevent overpressurizing the RCS due to rapid heatup.
- D. SG temperature must be greater than 260°F; to prevent a reactivity excursion due to a cold water accident.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 003**

Given the following conditions:

- Unit 2 is in MODE 5.
- RCS pressure is 180 psia.
- RCS is aligned with SDC Purification in service.

Which ONE (1) of the following describes the alignment for Shutdown Cooling purification of the RCS?

Shutdown Cooling connects...

- A. downstream of the Letdown Heat Exchanger. Flow is controlled by the Letdown Backpressure Control Valve and LPSI isolation valves.
- B. upstream of the Letdown Heat Exchanger. Flow is controlled by the Letdown Backpressure Control Valve and LPSI isolation valves.
- C. downstream of the Letdown Heat Exchanger. Flow is controlled by the Letdown Flow Control valves.
- D. upstream of the Letdown Heat Exchanger. Flow is controlled by the Letdown Flow Control valves.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 004**

Given the following conditions:

- Unit 3 shutdown and cooldown to MODE 5 is in progress.
- Shutdown Cooling is in service.
- RCS temperature is 300°F.
- RCS cooldown rate is 20°F per hour.

To maintain a constant RCS cooldown rate, which ONE (1) of the following describes the operation of the Shutdown Cooling Heat Exchanger Bypass Valve as the plant is cooled down?

- A. Throttled closed to maintain constant cooldown rate as RCS temperature is reduced, with Heat Exchanger flow maintained constant.
- B. Throttled open to ensure total Shutdown Cooling flow is constant as the Heat Exchanger outlet valve is throttled closed.
- C. Throttled closed to ensure total Shutdown Cooling flow is constant as the Heat Exchanger outlet valve is throttled open.
- D. Throttled open to maintain constant cooldown rate as RCS temperature is reduced, with Heat Exchanger flow maintained constant.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 005**

Given the following conditions:

- A large Loss of Coolant Accident is in progress.
- SIAS, CIAS, MSIS, CSAS, and RAS have actuated.
- RWST level is 16%.
- Containment emergency sump level is 20 feet.
- ECCS valves are in the following positions:
  - RWST outlet isolation valves HV9300/HV9301 OPEN.
  - Containment emergency sump outlet valves HV9302/HV9303 OPEN.
  - Containment emergency sump outlet valves HV9304/HV9305 OPEN.
  - SI pumps and Containment Spray pumps Mini-Flow isolation valves HV9306/HV9307 OPEN.

Which ONE (1) of the following valve pairs has failed to automatically reposition to its Recirculation Actuation Signal (RAS) position?

- A. HV9300/HV9301
- B. HV9302/HV9303
- C. HV9304/HV9305
- D. HV9306/HV9307

U.S.N.R.C. Site-Specific Written Examination  
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Senior Reactor Operator

**Question 006**

Given the following Unit 2 conditions:

- Reactor tripped from 100% power.
- Pressurizer pressure = 1870 psia.
- Containment pressure = 3.8 psig.

Assuming no operator actions, which ONE (1) of the following states where RCP bleedoff flow is being directed?

- A. Volume Control Tank
- B. Reactor Coolant Drain Tank
- C. Quench Tank
- D. Containment Sump

U.S.N.R.C. Site-Specific Written Examination  
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Senior Reactor Operator

**Question 007**

Given the following conditions:

- Reactor startup is in progress.
- Shutdown CEAs fully withdrawn.
- Regulating CEAs in Group 4 being moved (partially withdrawn).
- AFW is in operation to maintain SG levels.
- An inadvertent CIAS signal occurs.

Which ONE (1) of the following actions is required?

- A. Trip the reactor due to isolation of Instrument Air to containment.
- B. Trip the reactor and then stop all RCPs due to loss of CCW to containment.
- C. Trip the reactor and then stop all RCPs due to loss of controlled bleedoff flow.
- D. Reinitiate feed to the SGs by overriding and opening the Aux. Feed Isolation valves.

U.S.N.R.C. Site-Specific Written Examination  
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Senior Reactor Operator

**Question 008**

Given the following conditions:

- Unit 3 is at 100% power.
- The following annunciators are received:
  - 50A04, PZR PRESSURE DEVIATION HI/LO
  - 50A14, PZR PRESSURE HI/LO

The RO determines that the selected channel for Pressurizer Pressure control, PT-0100X, is failing LOW.

If NO action is taken by the crew, which ONE (1) of the following describes the response of the plant?

- A. Reactor trip on Low Pressurizer Pressure.
- B. Heaters deenergize to maintain pressure between 2200 and 2225 psia.
- C. Spray valves open to maintain pressure at 2275 psia.
- D. Reactor Trip on High Pressurizer Pressure.

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Senior Reactor Operator

**Question 009**

Which ONE (1) of the following generates the Turbine Trip signal when a Reactor Trip occurs?

- A. CEDM Buses Undervoltage Relays
- B. RPS Logic Matrices Output Relays (AB1-CD4)
- C. Reactor Trip Circuit Breaker Control Relays (K1-K4)
- D. Reactor Trip Circuit Breaker Undervoltage Trip Coils

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 010**

Given the following conditions:

- Unit 2 is at 100% power.
- Pressurizer Level Control is selected to Channel X.
- Pressurizer Pressure Control is selected to Channel X.

Which ONE (1) of the following describes a result from a loss of Vital Instrument Bus 2Y02?

- A. CEAC 1 failure.
- B. All Pressurizer Heaters energize.
- C. All 3 Charging Pumps automatically start.
- D. Reactor trip due to a CPC channel B Aux Trip.

U.S.N.R.C. Site-Specific Written Examination  
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Senior Reactor Operator

**Question 011**

Given the following conditions:

- Unit 3 tripped from 100% power 15 minutes ago.
- MSIS and EFAS have actuated.
- No operator actions have been taken.

Which ONE (1) of the following sets of conditions would result in Auxiliary Feedwater flow to a Steam Generator?

- A. E088 pressure - 695 psia  
E089 pressure - 490 psia  
E088 NR level - 15%  
E089 NR level - 27%
- B. E088 pressure - 725 psia  
E089 pressure - 690 psia  
E088 NR level - 15%  
E089 NR level - 28%
- C. E088 pressure - 600 psia  
E089 pressure - 750 psia  
E088 NR level - 18%  
E089 NR level - 30%
- D. E088 pressure - 735 psia  
E089 pressure - 600 psia  
E088 NR level - 28%  
E089 NR level - 18%

U.S.N.R.C. Site-Specific Written Examination  
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Senior Reactor Operator

**Question 012**

Given the following:

- A reactor trip has occurred on Unit 3.
- RCS pressure is 1700 psia and lowering.
- Containment pressure is 6 psig and rising.
- All equipment is operating as designed.

Which ONE (1) of the following describes the status of Containment Cooling?

- A. 2 Normal Cooling Units operating, being supplied by Chilled Water.
- B. 4 Normal Cooling Units operating, being supplied by Chilled Water.
- C. 2 Emergency Cooling Units operating, being supplied by Component Cooling Water.
- D. 4 Emergency Cooling Units operating, being supplied by Component Cooling Water.

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Senior Reactor Operator

**Question 013**

An ESDE resulting in a SIAS has occurred. Containment parameters have increased to the following values:

- Containment Temperature = 243°F.
- Containment Pressure = 12 psig.

Which ONE (1) of the following describes effects of the containment environment on the Pressurizer level instruments?

Indicated level is...

- A. LOWER than Actual level due to the high containment TEMPERATURE.
- B. LOWER than Actual level due to the high containment PRESSURE.
- C. HIGHER than Actual level due to the high containment TEMPERATURE.
- D. HIGHER than Actual level due to the high containment PRESSURE.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 014**

Given the following conditions:

- A LOCA has occurred.
- Containment pressure peaked at 27 psig, now indicates 12 psig and lowering slowly.
- All required ECCS equipment is operating.
- RAS has occurred.
- Containment Emergency Sump level is 23.5 feet.
- The crew is evaluating RAS operation in IAW SO23-12-11, Attachment 14, RAS Operation.
- HPSI and Containment Spray pump amps, pressure, and flow are oscillating.

Which ONE (1) of the following describes why the conditions exist, and the action required in accordance with Attachment 14?

- A. The Containment Emergency Sump has blockage. Trip the Containment Spray Pumps and throttle HPSI to minimum requirements.
- B. The Containment Emergency Sump has blockage. Trip HPSI pump and throttle Spray flow to minimum requirements.
- C. Containment Emergency Sump level is below the minimum required. Trip the Containment Spray Pumps and throttle HPSI to minimum requirements.
- D. Containment Emergency Sump level is below the minimum required. Throttle HPSI pumps and throttle Spray flow to minimum requirements.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 015**

Which ONE (1) of the following is the power supply to Unit 2 Containment Spray Pump P-013?

- A. 2A04
- B. 2A06
- C. 2B04
- D. 2B06

U.S.N.R.C. Site-Specific Written Examination  
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Senior Reactor Operator

**Question 016**

A Steam Generator Tube Rupture has occurred.

Which ONE (1) of the following radiation monitors will provide the MOST ACCURATE identification of the affected SG?

- A. Air Ejector LOW Range, RE-7818.
- B. Main Steam Line LOW Range, RE-7874-A1/B1.
- C. Air Ejector WIDE Range, RE-7870.
- D. Main Steam Line HIGH Range, RE-7875-A1/B1.

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Senior Reactor Operator

**Question 017**

The crew is responding to a Feedwater Control System failure in accordance with AOI 13-24, Feedwater Control System Malfunctions.

The following conditions exist:

- SG E-088 level is approximately 10% above program and rising.
- SG E-089 level is approximately 3% above program and rising.
- SG E-088 Master Controller output is rising, and feedwater control valve is opening.
- SG E-089 Master Controller output is lowering, and feedwater control valve is closing.
- K-006 EAP/MSC speed is lowering.
- K-005 EAP/MSC speed is lowering.

Which ONE (1) of the following actions is required next?

- A. Place SG E-088 Master Controller in Preferred Manual and lower output.
- B. Place SG E-088 Feedwater Control Valve in manual and throttle in the close position.
- C. Place K-006 EAP/MSC in Manual and raise output.
- D. Place K-005 EAP/MSC in Manual and raise output.

U.S.N.R.C. Site-Specific Written Examination  
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Senior Reactor Operator

**Question 018**

Given the following:

- The Reactor has tripped.
- Steam Generator E-089 level indicates below the EFAS setpoint.
- EFAS-1 has not actuated automatically.
- SG Pressure in E-089 is 900 psia.

Which ONE (1) of the following describes the MINIMUM action required to fully initiate an **EFAS-1** to maintain Steam Generator E-089 level on the **cycling relays**?

- A. Depress two (2) EFAS-1 manual trip buttons in the Control Room one (1) time.
- B. Depress two (2) EFAS-1 manual trip buttons in the Control Room two (2) times.
- C. Depress all four (4) EFAS-1 manual trip buttons in the Control Room one (1) time.
- D. Depress all four (4) EFAS-1 manual trip buttons in the Control Room two (2) times.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 019**

What is the normal source of 6.9 kV power to the Unit 2 Reactor Coolant Pumps during full power operations?

- A. Main Transformer 2XM
- B. Unit Auxiliary Transformer 2XU2
- C. Reserve Auxiliary Transformer 2XR3
- D. Reserve Auxiliary Transformer 3XR3

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 020**

Given the following conditions:

- Unit 2 is at 100% power.
- The following alarm is received:
  - 63A32, 2D1 125 VDC BUS TROUBLE

An operator is dispatched to determine if there is a ground on 125 VDC Bus 2D1.

Which ONE (1) of the following describes how the location of the ground may be determined, and the first action required to identify and isolate it if the ground is not readily identifiable?

One of the ground detector LEDs on the DC Bus Panel will be...

- A. extinguished. Isolate the battery charger from the DC Bus.
- B. extinguished. Isolate individual loads from the DC Bus.
- C. solidly illuminated. Isolate the battery charger from the DC Bus.
- D. solidly illuminated. Isolate individual loads from the DC Bus.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 021**

Given the following conditions:

- Emergency Diesel Generator surveillance is in progress.
- 2G003 is fully loaded on bus 2A06.
- A Switchyard low voltage alarm is received:
  - Switchyard voltage is 218 kV and steady.

Operator response per SO23-13-4, Operation During Major System Disturbances, requires unloading the emergency diesel generator and opening the output breaker.

Which ONE (1) of the following describes the reason for this action in SO23-13-4?

- A. To enable the Degraded Voltage protection circuit.
- B. To restore Unit 2 to within the Technical Specification Limiting Condition for Operation (LCO) for EDG operability.
- C. To raise bus voltage, preventing potential damage to normally running bus loads.
- D. To prevent EDG trip on generator differential overcurrent.

U.S.N.R.C. Site-Specific Written Examination  
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Senior Reactor Operator

**Question 022**

An air leak on an air receiver for EDG 2G002 requires isolating the #1 air starting subsystem for repairs.

With the outlet isolation valve closed for this air receiver (assume no other valve or component manipulations), which ONE (1) of the following describes the effect on the EDG if an automatic start signal is received?

- A. The EDG will NOT start because starting air is isolated.
- B. The EDG will start but the air system capacity may not be high enough to start the EDG within the required 10 seconds.
- C. The EDG will start because starting air will be provided to the in-service air start motors by the other air system.
- D. The EDG will start because the air start systems are cross-connected downstream of each air receiver.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 023**

Given the following conditions:

- Unit 3 is in MODE 6.
- Irradiated Fuel movement is in progress.
- A spent fuel assembly is damaged while being transported to the spent fuel racks.
- Spent Fuel Pool area radiation high alarm is in.
- Spent Fuel Handling Building air exhaust process radiation monitors, RE-7822 and RE-7823, high alarms are in.

Which ONE (1) of the following describes the resulting ventilation alignment?

- A. Fuel Handling Building normal supply fan trips.  
Fuel Handling Building normal exhaust fan remains running.  
Fuel Handling Building PACUs take suction from the Fuel Handling Building intake dampers and discharge downstream of the Fuel Handling Building normal exhaust fan.
- B. Fuel Handling Building normal supply and exhaust fans are tripped.  
Fuel Handling Building PACUs take suction from the Fuel Handling Building atmosphere and discharge back to the Fuel Handling Building atmosphere.
- C. Fuel Handling Building normal supply fan trips.  
Fuel Handling Building normal exhaust fan remains running.  
Fuel Handling Building PACUs take suction from Fuel Handling Building Intake dampers and discharge back to the Fuel Handling Building atmosphere.
- D. Fuel Handling Building normal supply and exhaust fans are tripped.  
Fuel Handling Building PACUs take suction from the Fuel Handling Building intake dampers and discharge downstream of the Fuel Handling Building normal exhaust fan.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 024**

Which ONE (1) of the following ensures the operability of the Saltwater Cooling System pumps upon a loss of normal Service Water?

- A. Pumps can run without bearing seal water for 2.5 hours.
- B. Bearing Seal Water Backup comes off of the Saltwater Cooling Pump Discharge.
- C. The condensate system can supply bearing seal water to the pumps.
- D. TPCW can supply bearing seal water to the pumps.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 025**

Given the following conditions:

- Train B CCW/SWC is in service.
- Train A is in Standby with SWC P-112 aligned.

Which ONE (1) of the following describes the subsequent operation of SWC Pump P-112 if an automatic SIAS signal is generated?

- A. Immediately starts automatically.
- B. Starts automatically in approximately 20 seconds.
- C. Must be manually started, and will start 5 seconds after the START Pushbutton is depressed.
- D. Will start automatically 5 seconds after the associated CCW pump starts, but must be manually started if no CCW pump starts.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 026**

Given the following conditions:

- Unit 2 and 3 are at 100% power.
- The following alarms are received in the control room:
  - 61C19, INST AIR HEADER PRESS LOW
  - 61B39, INST AIR DRYER TEMP/LVL/DP HI
- 2PI5344A and 3PI5344A, Instrument Air Header Pressure, both indicate 85 psig and lowering slowly.
- All Instrument Air Compressors are running.
- An operator has been dispatched to locally check instrument air flow and pressure indication.

Which ONE (1) of the following actions will be performed next?

- A. Trip the reactor; perform EOI 12-1, Standard Post Trip Actions.
- B. Open SA2417MU036, Air Dryer Bypass Valve. Place the standby instrument air filter in service.
- C. Place Auxiliary Spray in service per SO23-3-1.10 and operate charging pumps as necessary to maintain pressurizer level.
- D. Fail open in-service Salt Water Cooling discharge valves to prevent a loss of Salt Water Cooling system flow.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 027**

Which ONE (1) of the following describes the power supply arrangement to the Instrument Air Compressors?

	<u>C001</u>	<u>C002</u>	<u>C003</u>
A.	2B06	B10	3B06
B.	B10	2B07	3B07
C.	2B07	B10	3B07
D.	2A04	3A04	B10

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 028**

Given the following conditions:

- Reactor has tripped from 100% power.
- Reactor coolant system pressure is 1650 psia and dropping.
- Pressurizer level is 10% and dropping.
- Steam generator levels have turned at 21% NR and are recovering.
- Steam generator pressures are 980 psia and rising.
- Containment pressure is 7.4 psig and rising.
- Safety Injection and Emergency Feedwater actuations have occurred.

Assuming all systems functioned as designed, which ONE (1) of the following states the additional Engineered Safety Features Actuation(s) present?

- A. Main Steam Isolation Actuation, Containment Cooling Actuation, Control Room Isolation.
- B. Containment Spray Actuation, Containment Cooling Actuation, Containment Isolation Actuation.
- C. Containment Isolation Actuation, Containment Cooling Actuation, Control Room Isolation.
- D. Main Steam Isolation, Containment Isolation Actuation, Control Room Isolation.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 029**

Given the following conditions:

- With Unit 2 at 50% power, 1 full length CEA is dropped to the bottom of the core.

Which ONE (1) of the following describes the most accurate indication of the dropped rod, and the reason why?

- A. Reed Switch Position Transmitters; they provide separate contacts that indicate a CEA is dropped.
- B. Reed Switch Position Transmitters; they provide input to CEA upper and lower electrical limits.
- C. CEA Pulse Counters; they provide positive indication of CEA position by inputting to the plant computer and CEAC displays.
- D. CEA Pulse Counters; they provide input to CEAC 1 and 2, providing input to the Core Protection Calculator for CEA penalty factors.

U.S.N.R.C. Site-Specific Written Examination  
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Senior Reactor Operator

**Question 030**

Which ONE (1) of the following accurately describes why a partially inserted CEA could cause a difference between the green pen and red pen indications of the Safety Channel Excore Linear Power recorders (JR-0002) on CR-56?

- A. CPC power is corrected for rod shadowing effects while Excore power is not.
- B. Excore power is corrected for rod shadowing effects while CPC power is not.
- C. CPC and Excore power indications are derived from different detector systems.
- D. CPC power is corrected for both Tc and rod shadowing while Excore power is only corrected for Tc shadowing.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 031**

Which ONE (1) of the following describes how the control signals and plant protection signals generated by RCS loop temperatures function?

- A. Separate detectors are used for protection and control.
- B. Each detector is provided with two separate outputs; one for control, one for protection.
- C. Isolation amplifiers from the output of each detector ensure that feedback from the control signal will not affect the protection channel.
- D. Detector outputs are multiplexed to be processed separately by the control and protection circuitry.

U.S.N.R.C. Site-Specific Written Examination  
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Senior Reactor Operator

**Question 032**

Which ONE (1) of the following could be an indication of the core becoming uncovered?  
(Assume instruments are accurate.)

CET temperature equal to:

- A. 535°F with RCS pressure equal to 1100 psia.
- B. 570°F with RCS pressure equal to 1550 psia.
- C. 590°F with RCS pressure equal to 1350 psia.
- D. 605°F with RCS pressure equal to 1700 psia.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 033**

Given the following conditions:

- Unit 2 is at 100% power.
- An entry into Containment is planned.
- Chemistry has determined the Oxygen level is 16.2%.
- Containment Mini Purge supply fan is out of service due to an overcurrent fault on the motor.

In accordance with SO23-3-2.34, Containment Access Control, Inspections, and Airlock Operation, which ONE (1) of the following states a requirement that must be met for entry into containment?

- A. Defeat emergency and personnel airlocks, open all four doors and start the mini purge exhaust fan.
- B. Self – contained respiratory protection will be required upon initial Containment entry.
- C. Access is limited to 63-foot level and below. Gantry crane access is not allowed.
- D. Place Main Purge Supply and Exhaust fans in service prior to Containment entry.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 034**

Given the following conditions:

- Unit 3 is in MODE 1.
- Spent Fuel Pool Level has been lowering.
- The crew is performing actions of AOI SO23-13-23, Loss of Spent Fuel Cooling.
- The source of the leak has NOT been determined.
- The Spent Fuel Pool Cooling Discharge Siphon Breaker is uncovered.

Which ONE (1) of the following describes the impact of this condition, and the action that is required in accordance with AOI SO23-13-23?

- A. The SFP Cooling Pumps may become air-bound. Stop any running SFP Cooling Pump, and vent the casing prior to restarting.
- B. The SFP Cooling Pumps may become air-bound. Stop the running SFP Cooling Pump, initiate makeup to the Spent Fuel Pool, start the standby SFP Cooling Pump.
- C. Fuel Handling Building Airborne Radiation Levels may increase due to agitation of the bottom of the SFP. Initiate 1 Train of FHIS while making up to the SFP.
- D. Fuel Handling Building Airborne Radiation Levels may increase due to the decreased shielding of SFP water. Initiate makeup via NSW hose which should be submerged more than 3 ft below the surface of the water.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 035**

Which ONE (1) of the following describes the Shutdown Cooling System relationship with Refueling Operations?

- A. Used to fill, drain, and cool the Refueling Pool. Provides the primary means of Spent Fuel Pool Cooling and Purification during Refueling operations.
- B. Used to fill, drain, and cool the Refueling Pool. Serves as a backup for SFP Cooling.
- C. Used for primary means of Spent Fuel Pool makeup from RWST. May be run in parallel with the SFP Cooling System when heat load is high.
- D. Used for primary means of Spent Fuel Pool makeup from RWST. Provides primary means of Spent Fuel Pool Cooling and Purification during Refueling operations.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 036**

With the Unit at 100% power, the Steam Bypass Control System (SBCS) Master Controller is in AUTO with the remote setpoint selected.

Individual valves are aligned as follows:

<u>Valve</u>	<u>Controller</u>	<u>Permissive</u>
#1 HV8423	Manual	Auto
#2 HV8424	Auto	Manual
#3 HV8425	Auto	Auto
#4 HV8426	Manual	Manual

Which SBCS valve would automatically open if the Master Controller output fails high?

- A. #1
- B. #2
- C. #3
- D. #4

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San Onofre  
Senior Reactor Operator

**Question 037**

Which ONE (1) of the following pairs contains ONLY radiation monitors with automatic actuations associated with rising radiation levels?

- A. CCW Non-Critical Loop, RE7819; Radwaste Condensate Return, RE7812.
- B. Containment Area Low Range, RE7845; BPS Neutralization Sump RE7817.
- C. Turbine Building Sump Discharge RE7821; CCW Non-Critical Loop RE7819.
- D. BPS Neutralization Sump RE7817; Turbine Building Sump Discharge RE7821.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 038**

Given the following conditions:

- Unit 2 is in MODE 4 during an RCS heatup.
- The Waste Gas system has all controls in automatic with Gas Decay Tank T-085 in service with a pressure of 240 psig.
- Waste Gas Compressor 2C-010 is in LEAD; 2C-011 is in STANDBY.
- NO releases are in progress.
- Waste Gas Surge Tank pressure has risen to 3.2 psig and is stable.

Which ONE (1) of the following describes the operation of the Waste Gas System in this condition?

- A. BOTH Waste Gas Compressors are RUNNING; Waste Gas Surge Tank Pressure Control valve, PCV-7200 is OPEN.
- B. BOTH Waste Gas Compressors are RUNNING; Waste Gas Surge Tank Pressure Control valve, PCV-7200 is CLOSED.
- C. Waste Gas Compressor 2C-010 is RUNNING; Waste Gas Compressor 2C-011 remains in STANDBY; Waste Gas Surge Tank Pressure Control valve, PCV-7200 is CLOSED.
- D. Waste Gas Compressors are OFF; Waste Gas Surge Tank Pressure Control valve, PCV-7200, is OPEN, maintaining system pressure.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 039**

Unit 2 Reactor/Turbine trip has occurred, and the following conditions exist:

- Unit Output Breakers 4062 and 6062 are still closed and could not be opened from the Control Room.
- Local Breaker Failure Backup (LBFBU) actuation has not occurred.
- All Main Turbine Stop and Governor Valves are closed.
- Main Turbine speed is 1800 RPM and stable.

Which ONE (1) of the following actions is immediately required?

- A. Manually trip the Main Turbine.
- B. Close the Main Steam Isolation Valves (MSIVs).
- C. Transfer 2/3 L224 to Unit 3 power, and again attempt to open Unit Output Breakers 4062 and 6062.
- D. Deenergize the Unit 2 Reserve Aux Transformers to prevent fault propagation to the 1E and non-1E buses.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 040**

Given the following conditions:

- A LOCA has occurred.
- RCS subcooling is 7°F and trending down.
- Pressurizer level is 100% and steady.
- HPSI injection valves are fully open.
- No RCP's are running.
- Containment temperature is 235°F.
- Containment pressure is 11 psig.

Which ONE (1) of the following actions will be performed by the crew?

- A. Secure HPSI pumps to allow RCS to depressurize so maximum injection flow with the LPSI system can be achieved.
- B. Throttle HPSI flow to allow depressurization of the primary system and prevent pressurized thermal shock.
- C. Throttle HPSI flow to restore pressurizer level to indicating range.
- D. Continue maximum HPSI injection flow to ensure adequate cooling for the core.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 041**

Given the following plant conditions:

- A small break LOCA is in progress and SIAS has actuated.
- All systems are operating as expected.

Per the stated conditions, which ONE (1) of the following is the basis for maintaining a secondary heat sink?

- A. Reflux boiling is the primary means of heat removal prior to voiding in the hot legs.
- B. To minimize boron stratification of the RCS.
- C. RCS pressure may remain so high that cooling from the injection flow alone is inadequate to remove decay heat.
- D. To provide for Containment temperature and pressure control.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 042**

Given the following conditions:

- A LOCA has occurred on Unit 2.
- RCS pressure is 500 psia.

Which ONE (1) of the following actions will enhance RCS heat removal?

- A. Raise SG ADV setpoint to prevent or collapse RCS voids.
- B. Raise RCS makeup to increase RCS inventory.
- C. Raising AFW flow to increase SG inventory.
- D. Raise RCS pressure to increase RCS subcooling.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 043**

Given the following conditions:

- A total loss of CCW has just occurred.
- The crew has entered SO23-13-7, Loss of Component Cooling Water (CCW)/Saltwater Cooling (SWC).
  - RCP Thrust Bearing temperatures are 205°F and rising at 2°F per minute.
  - RCP Seal Return temperature is 180°F and rising at 1°F every 2 minutes.
  - RCP Seal DPs are within normal ranges.

If CCW flow cannot be restored, what is the MAXIMUM time allowed by the AOI before the reactor must be tripped?

- A. 1 minute.
- B. 5 minutes.
- C. 8 minutes.
- D. 10 minutes.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 044**

Given the following conditions:

- Unit 2 is at 100% power.
- The following alarms are received:
  - 50A23, PZR LEVEL ERROR LO
  - 58A01, REGEN HX TSH 9267 LETDOWN TEMP HI
- The RO determines that all PZR level instrumentation is trending down.
- Letdown flow is 35 GPM and trending down.
- The crew enters AOI SO23-13-27, Pressurizer Pressure and Level Malfunction.
- The trends continue as before.

Of the choices below, which ONE (1) is the probable cause?

- A. Letdown Flow Controller failure.
- B. Loss of Charging flow.
- C. Pressurizer level controller setpoint failure.
- D. Letdown backpressure control valve input failure.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 045**

Given the following conditions:

- Unit 2 is shutdown on Shutdown Cooling.
- Cooldown is in progress at 40°F/hr.
- RCS Temperature is 280°F.
- RCS pressure is 300 psia.
- Train B CCW Surge Tank Level has risen from 40% to 55% in 20 minutes.
- Pressurizer Level is 60% and stable.
- VCT level dropped from 77% to 73% in 20 minutes.

Which ONE (1) of the following components is causing the CCW Surge Tank Level rise?

- A. CEDM Cooler leak.
- B. Spent Fuel Pool heat exchanger tube leak.
- C. Shutdown Cooling heat exchanger tube leak.
- D. Steam Generator sample cooler leak.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 046**

Given the following conditions:

- Unit 2 is at 100% power.
- CCW Non-Critical Loop is supplied by Train A.
- A CCW leak is occurring.
- CCW Surge Tank T-003 level is lowering slowly.
- The crew is taking action to locate and isolate the leak in accordance with AOI SO23-13-7, Loss of CCW/SWC.

Which ONE (1) of the following describes the initial action required to attempt to identify the CCW leak per the AOI?

- A. Trip Reactor, stop Reactor Coolant Pumps 5 sec later, then Isolate Non-Critical Loop.
- B. Isolate the Letdown Heat Exchanger.
- C. Isolate Radwaste CCW header from Unit 2.
- D. Place Emergency Chillers on Train B.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 047**

Given the following conditions:

- A Steam Generator Tube Rupture has occurred on SG E-089.
- Actions of SO23-12-4, SGTR, are being taken.
- SG E-089 level is off-scale high.
- Pressurizer level is off-scale low.
- ECCS is operating as designed.
- SG E-089 has just been isolated.
- RCS pressure is 1250 psia and slowly lowering.
- SG E-089 pressure is 1050 psia and slowly rising.

Which ONE (1) of the following actions is required, and the reason for the action?

- A. Commence lowering RCS pressure to prevent lifting Steam Generator safeties.
- B. Raise the setpoint of SG E-089 ADV to minimize radiological release.
- C. Open SG E-089 MSIV to prevent overpressurization of the ruptured SG.
- D. Maintain RCS pressure greater than SG E-089 pressure to minimize RCS dilution.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 048**

At 100% power End of Cycle (EOC) conditions, which ONE (1) of the following will provide the most negative reactivity insertion within the first minute following an ATWS?

- A. Manual Turbine Trip.
- B. RCS boration at 10 gpm.
- C. Manual CEA insertion at 30 inches per minute.
- D. Closing a failed open SBCS valve.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 049**

Which ONE (1) of the following describes the reason for reducing DC loads on Battery Bus 2D1 during a Station Blackout?

Reducing Bus 2D1 loads increases the availability from...

- A. 90 minutes to 2 hours
- B. 90 minutes to 4 hours
- C. 2 hours to 4 hours
- D. 4 hours to 8 hours

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 050**

Unit 3 is operating at 100% power when a Loss of Off-Site power causes a reactor trip. Ten minutes after the trip, the following conditions exist:

- SG E-088 Pressure is 1040 psia and stable.
- SG E-089 Pressure is 1035 psia and stable.
- All RCPs are OFF.
- PZR Pressure is 2200 psia and stable.
- Thot is approximately 578°F in both loops and rising.
- REPCET is 598°F.
- Tcold is approximately 558°F in both loops and rising.

Which ONE (1) of the following describes the status of RCS Heat Removal?

- A. Natural Circulation exists. The SBCS control valves are maintaining heat removal.
- B. Natural Circulation does not exist. Heat removal may be established by opening the SBCS control valves.
- C. Natural Circulation exists. ADVs are maintaining heat removal.
- D. Natural Circulation does not exist. Heat removal may be established by opening the ADVs.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 051**

Given the following conditions:

- Unit 3 is at 100% power.
- Pressurizer Level Control is selected to channel LI-0110Y.
- A loss of Inverter Y002 occurs due to overcurrent on the inverter output breaker.
- The crew confirms that all other inverters are energized.

Which ONE (1) of the following describes the NEXT action to be taken in accordance with AOI SO23-13-18, Reactor Protection System Failure/Loss of Vital Bus?

- A. Select Pressurizer Level Select Switch HS-0110 to Level Channel LI-0110X.
- B. Close EFAS Trip Path 2 and 4 control valves.
- C. Reset and Reenergize pressurizer heaters.
- D. Ensure all Reactor Trip Circuit Breakers are closed.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 052**

Given the following conditions:

- Unit 2 is in MODE 1 with all equipment operating normally.
- A loss of 480VAC MCC 2BY occurs.

Prior to any action by the crew, which ONE (1) of the following describes the power alignment to vital bus Y01?

- A. Powered from normal source from Inverter Y001 with Battery Charger B001.
- B. Powered from normal source from Inverter Y001 with Battery B007 (Battery Bank A).
- C. Powered from alternate source through inverter Static Switch transfer.
- D. De-energized until manually aligned to alternate source with Manual Transfer Switch.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 053**

Given the following conditions:

- A reactor trip has occurred.
- The crew is performing actions per SO23-12-2, Reactor Trip Recovery.
- Train A is supplying CCW Non-Critical Loop.
- SWC P-112 TRIPPED and CANNOT be restarted.

Which ONE (1) of the following actions is required for the Salt Water Cooling failure?

- A. Trip all RCPs.
- B. Stop Train A CCW Pumps then transfer all loads to Train B.
- C. Ensure all ECCS pumps are stopped.
- D. Place the CCW non-critical loop on the opposite train.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 054**

Given the following conditions:

- Unit 2 is at 100% power.
- 61B58, INSTR AIR COMPRESSOR CONTROL PANEL TROUBLE alarm is received.
- The Nitrogen Backup Supply is maintaining pressure on the Instrument Air Header.

Which ONE (1) of the following describes when an “orderly plant shutdown” will be initiated in accordance with SO23-13-5, Loss of Instrument Air?

- A. Immediately.
- B. When Instrument Air header pressure falls below 50 psig with no chance of recovery.
- C. When it is determined that normal supply system pressure cannot be restored or maintained.
- D. When control of feedwater flow or pressurizer pressure is lost or the Containment Air header isolates.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 055**

Given the following conditions:

- A reactor trip has occurred.
- Off-Site power has been lost.
- Containment pressure is 12 psig and rising slowly.
- Containment Radiation levels are normal.
- RCS pressure is 1725 psia and lowering slowly.
- SG E-088 pressure indicates 860 psia and lowering slowly.
- SG E-089 pressure indicates 720 psia and lowering slowly.

Which ONE (1) of the following procedures will be used to mitigate this event?

- A. SO23-12-2, Reactor Trip Recovery.
- B. SO23-12-7, LOOP/LOFC.
- C. SO23-12-5, ESDE.
- D. SO23-12-3, Loss of Coolant Accident.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 056**

Given the following plant conditions:

- A Loss of Feedwater has occurred on Unit 2.
- The crew is performing actions of SO23-12-6, Loss of Feedwater.
- AFW Pump P-140 has just been restored.
- SG Levels are both indicating approximately 25% WR.

Which ONE (1) of the following describes the initial method required to restore AFW flow?

- A. Feed at the maximum rate to restore secondary heat sink.
- B. Feed at the maximum rate to enhance single phase natural circulation cooling.
- C. Feed at a reduced rate to minimize RCS cooldown.
- D. Feed at a reduced rate to minimize thermal shock to SG components.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 057**

Unit 2 is operating at 75% power with all CEAs fully withdrawn, when a group 6 CEA drops to the bottom of the core.

Assuming the rod cannot be immediately recovered, what is the MINIMUM REQUIRED Power Reduction one hour after the CEA drop?

- A. 2%
- B. 5%
- C. 10%
- D. 15%

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 058**

Which ONE (1) of the following describes a reason for initiating an emergency boration due to multiple Full Length CEAs being stuck while performing Standard Post Trip Actions?

- A. To insert negative reactivity in the event that the Main Turbine fails to trip.
- B. To ensure Technical Specification Shutdown Margin requirements are met.
- C. Emergency boration is the ONLY means available to shut down the reactor if the Manual reactor trip pushbuttons do not function.
- D. Boration flow is required because the Diverse Scram System (DSS) is not credited in the SONGS Safety Analysis.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 059**

Which ONE (1) of the following describes the purpose of the Thot input to the Pressurizer Level Control System, and the response of the system if the input failed to its current value during a plant power reduction?

- A. Provides input to Tavg to determine reference level. Failure would cause actual Pzr level to be lower than program level during a power reduction.
- B. Provides input to Tavg to determine reference level. Failure would cause actual Pzr level to be higher than program level during a power reduction.
- C. Provides input directly to the master controller to determine reference level. Failure would cause actual Pzr level to be lower than program level during a power reduction.
- D. Provides input directly to the master controller to determine reference level. Failure would cause actual Pzr level to be higher than program level during a power reduction.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 060**

Given the following conditions:

- The Unit is in MODE 3.
- A Reactor Startup is in progress.
- CEAs are being withdrawn.
- Both Startup Channels have just failed to zero.

Which ONE (1) of the following is the reason that CEA withdrawal is stopped?

- A. CPCs will NOT be enabled during the power increase.
- B. Startup rate CANNOT be monitored without the Startup channels.
- C. Tech Spec LCS requires immediate suspension of positive reactivity additions.
- D. Tech Spec LCO requires the Audio Count Rate Monitor to be OPERABLE during a reactor Startup.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 061**

During a Steam Generator Tube Rupture, the crew is cooling down and depressurizing the RCS in accordance with SO23-12-4, Steam Generator Tube Rupture.

When does reducing RCS pressure take priority over maintaining minimum RCP NPSH requirements?

- A. When pressurizer level is rising rapidly.
- B. When ruptured Steam Generator level is rising rapidly.
- C. When the ruptured Steam Generator is also suspected of having an ESDE.
- D. When intact SG level cannot be maintained at the minimum level for RCS cooldown.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 062**

Given the following:

- Unit 2 is at 100% power, **EOC**.
- RCS Boron Concentration is 28 ppm.
- A loss of condenser vacuum is occurring.
- The crew is performing actions of SO23-13-10, Loss of Condenser Vacuum.
- A power reduction is required.

Which ONE (1) of the following describes the operation of CEAs during the power reduction?

- A. Remain in their current position as long as turbine load reduction and RCS boration are effective in stabilizing vacuum.
- B. Inserted to maintain Tcold on program and ASI in the target band.
- C. Withdrawn to maintain Tcold on program and ASI in the target band.
- D. CEAs will be tripped due to inability to control ASI with a loss of condenser vacuum at EOC conditions.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 063**

Given the following:

- The plant is at 100% power.
- NO radioactive releases are in progress.
- Radwaste Secondary Tank T-057 has developed a large leak at the tank outlet.

Which ONE (1) of the following radiation monitors will be the first to indicate a high activity?

- A. Liquid Waste Discharge Monitor, RE7813.
- B. Plant Vent Stack Wide Range Monitor RE7865.
- C. BPS Neutralization Sump Monitor RE7817.
- D. Radwaste Condensate Return radiation monitor, RE7812.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 064**

In accordance with SO23-7-8, Fire System Computer Use and Operation, who may remove a fire zone point from scan?

- A. Fire Dept. Shift Captain.
- B. Instrumentation and Controls (I&C) Dept.
- C. SRO Operations Supervisor.
- D. Any licensed operator assigned to the shift.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 065**

A major earthquake occurred ten minutes ago.

The Reactor has tripped and the following conditions exist on Unit 2:

- A loss of the switchyard has occurred.
- Both SGs are at 17% NR level and no AFW flow can be established to either SG.
- Pressurizer Level is 12% and lowering.
- Containment Radiation Monitors are trending upscale.

Which ONE (1) of the following is the appropriate Emergency Operating Instruction to mitigate this event?

- A. SO23-12-8, Station Blackout.
- B. SO23-12-6, Loss of Feedwater.
- C. SO23-12-7, Loss of Forced Circulation / Loss of Offsite Power.
- D. SO23-12-9, Functional Recovery.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 066**

You are a licensed Reactor Operator and have been assigned to an administrative function.

- You are current in maintaining qualification in the Licensed Operator Requalification Program.
- The date is October 15, 2006 and you are preparing to return to shift duties.

The time you were on shift since this assignment is as follows:

- 12 hours on September 24, 2006 as the 22 Watch.
- 12 hours on September 23, 2006 as the 22 Watch.
- 12 hours on August 22, 2006 as the 22 Watch.
- 12 hours on June 19, 2006 as the 21 Watch.
- 12 hours on June 18, 2006 as the 21 Watch.

Which ONE (1) of the following describes the status of your license proficiency?

- A. Your license is active. You may stand watch with no restrictions.
- B. Your license is active. You must regain qualification as RO by standing three (3) additional 12 hour shifts in the 21 OR 31 Watch position.
- C. Your license is inactive. You must reactivate your license by standing 40 hours under instruction in the 21 OR 31 Watch position ONLY.
- D. Your license is inactive. You must reactivate your license by standing 40 hours under instruction as either 21, 22, 31, OR 32 Watch.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 067**

What MODE of operation would the Unit be in if the reactivity condition is 0.95 K-eff and average Reactor Coolant temperature is 360°F?

- A. MODE 2 – Startup
- B. MODE 3 – Hot Standby
- C. MODE 4 – Hot Shutdown
- D. MODE 5 – Cold Shutdown

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 068**

Given the following conditions:

- A reactor startup is being performed 20 hours after a trip from 100% power.
- Estimated Critical CEA Position is Reg. Group 5 at 60 inches.
- Criticality is predicted in 5 hours.

If the startup were to proceed 1/2 hour earlier than scheduled, what is the effect on the 1/M plot data taken during the startup?

1/M plot will...

- A. accurately predict criticality at a lower CEA position.
- B. accurately predict criticality at a higher CEA position.
- C. inaccurately predict criticality in a conservative direction.
- D. inaccurately predict criticality in a non-conservative direction.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 069**

A Post Maintenance Test is being performed to return a piece of equipment to service.

A portion of a Surveillance Procedure contains steps that may be used to satisfy the retest requirements.

Which ONE (1) of the following describes a requirement for partial use of the surveillance?

- A. A 10CFR50.59 screening must be performed.
- B. A Procedure Modification Permit must be initiated.
- C. The specific steps of the surveillance that will be performed must be identified in the Operability Verification block of the Prerequisites.
- D. All steps of the surveillance that will NOT be performed must be marked N/A and initialed by the SRO approving the retest.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 070**

During a Reactor Startup with a positive (+) ITC (isothermal temperature coefficient), reactor power is rising.

Which ONE (1) of the following describes the preferred way to stabilize power?

- A. Increase steaming.
- B. Decrease steaming.
- C. Initiate RCS boration.
- D. Insert CEAs as necessary.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 071**

A load increase is being performed in accordance with SO23-5-1.7, Power Operation.

Which ONE (1) of the following describes the preferred sequence of ASI control as power is raised above 50% power?

- A. PLCEAs, Group 5, Group 6.
- B. Group 5, Group 6, PLCEAs.
- C. Group 6, Group 5, PLCEAs.
- D. PLCEAs, Group 6, Group 5.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 072**

Given the following conditions:

- Unit 2 is in MODE 5.
- Containment Purge was stopped briefly for a filter change-out on 2RE-7828.
- The CRS has verified that the Release Permit is still valid.

Which ONE (1) of the following describes the FIRST action necessary to restart the Containment Purge in accordance with SO23-1-4.2, Containment Purge and Recirculation Filtration System?

- A. Open Purge Exhaust Unit Isolation Valves, 2HV-9950 and 2HV-9951.
- B. Open Purge Supply Unit Isolation Valves 2HV-9948 and 2HV-9949.
- C. Ensure the Containment Radiation Monitor, 2RE-7828, is reset.
- D. Start the Main Purge Exhaust Unit, 2MA-60.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 073**

Unit 2 was operating at 100% power when a SG tube rupture occurred on E-089.

Which ONE (1) of the following describes the preferred method of cooling down the RCS to MODE 5?

- A. Dump steam to the condenser using the E-088 SG ONLY to minimize radiological releases.
- B. Dump steam through the E-088 SG's ADVs ONLY to minimize contamination of the secondary system for ALARA reasons.
- C. Dump steam through the E-088 AND E-089 SG's ADVs to minimize contamination of the secondary system for ALARA reasons.
- D. Dump steam to the condenser using the E-088 AND E-089 SGs to minimize radiological releases.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 074**

What is the basis for the step in EOI SO23-12-6, Loss of Feedwater that requires the operators to ensure all RCPs are stopped?

- A. Prevent over pressurizing the RCS as pressurizer level rises.
- B. Reduce mass flow rate through the steam generators to maintain tube integrity.
- C. Prevent operating RCPs without adequate NPSH, due to RCS heatup.
- D. Extend time to SG dryout by limiting heat input into the RCS.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 075**

The plant is in MODE 1 when an event occurs requiring the use of an Abnormal Operating Instruction (AOI).

Due to plant conditions, not all of the steps directed by the AOI are applicable.

Which ONE (1) of the following actions should be taken?

- A. Log the steps NOT performed in the Control Operators Log.
- B. Initial the steps NOT performed and explain with comments.
- C. Mark the steps NOT performed as N/A and continue with the AOI.
- D. Pass over the steps and frequently recheck the steps NOT performed.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 076**

Given the following conditions:

- The plant is at 100% power.
- Two (2) Charging Pumps are operating.
- Letdown flow is 0 GPM.
- VCT Level is 41% and lowering at 4% per minute.
- Pressurizer level is 51% and lowering slowly.
- CFMS page 122, Ctmt Sump Tank 30 minute flow indicates 156 GPM.
- TI-0221 and TI-9267, Regenerative Heat Exchanger Outlet Temperature, is 350°F and rising.
- Containment humidity is rising.
- RCS Temperature is 547°F and stable.

Which ONE (1) of the following describes the event in progress and the action required?

- A. Letdown line leak. Isolate Letdown in accordance with SO23-13-14, Reactor Coolant Leak AOI.
- B. Charging line leak. Isolate Letdown in accordance with SO23-13-14, Reactor Coolant Leak AOI.
- C. Letdown line leak. Trip the reactor and enter SO23-12-1, SPTAs.
- D. Charging line leak. Trip the reactor and enter SO23-12-1, SPTAs.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 77**

Given the following conditions:

- Unit 3 is at 100% power.
- PV-0100A, PZR Spray Valve from Loop A, is open approximately 40%.
- RCS pressure is 2200 psia and trending down at 10 psi per minute.

(1) Which ONE (1) of the Technical Specification Safety Limits may be challenged by this event, and (2) which of the following actions is required?

- A. (1) Linear Heat Rate Safety Limit  
(2) Trip the reactor; enter SO23-12-1, SPTAs; trip the RCPs in Loop A when Reactivity Control is verified.
- B. (1) Linear Heat Rate Safety Limit  
(2) Attempt to close the Spray Valve in accordance with AOI SO23-13-27, Pressurizer Pressure and Level Control Malfunction.
- C. (1) DNBR Safety Limit  
(2) Attempt to close the Spray Valve in accordance with AOI SO23-13-27, Pressurizer Pressure and Level Control Malfunction.
- D. (1) DNBR Safety Limit  
(2) Trip the reactor; enter SO23-12-1, SPTAs; trip all RCPs when Reactivity Control is verified.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 078**

Following a Station Blackout on Unit 2, the Emergency Diesel Generator (EDG) 2G002 remains shutdown and offsite power has been RESTORED to the Reserve Auxiliary Transformers.

Which ONE (1) of the following **MUST** be performed in order to energize 1E 4 kV Bus 2A04 from the Reserve Auxiliary Transformer?

- A. Open Bus 2A04 knife-switches 127F1 through 127F4 in accordance with SO23-12-11, EOI Supporting Attachments.
- B. Open Bus 2A04 knife-switches 127F1 through 127F4 in accordance with SO23-12-7, Loss of Off-Site/Loss of Forced Circulation.
- C. Open the 50.54XA1, B1, A2, and B2 switches in accordance with SO23-12-11, EOI Supporting Attachments.
- D. Open the 50.54XA1, B1, A2, and B2 switches in accordance with SO23-12-7, Loss of Off-Site/Loss of Forced Circulation.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 079**

Given the following conditions:

- Unit 3 is at 100% power.
- The following alarms are received on CR57:
  - VITAL BUS 1 INVERTER FAILURE
  - Y01 INVERTER TROUBLE
- Lumigraphs for Channel 1 instrumentation indicate failed.
- DC BUS TROUBLE alarms are NOT lit.

Which ONE (1) of the following describes the time allowed to take action to restore the Vital Bus in accordance with Technical Specifications?

- A. 1 hour
- B. 2 hours
- C. 4 hours
- D. 8 hours

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 080**

The Reactor has tripped and four (4) Full-length CEAs are stuck out.

After opening the Reactor Trip circuit breakers locally, two (2) CEAs fall in. Reactor power is lowering and startup rate is negative.

What are the proper actions by the operating crew in response to this event?

- A. Emergency borate the RCS, and immediately go to SO23-12-9, Functional Recovery.
- B. Emergency borate the RCS, and immediately go to the SO23-12-2, Reactor Trip Recovery.
- C. Emergency borate the RCS, finish the Standard Post Trip Actions, and diagnose a Functional Recovery entry.
- D. Emergency borate the RCS, finish the Standard Post Trip Actions, and diagnose a Reactor Trip Recovery event.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 081**

Given the following conditions:

- Unit 2 is operating in MODE 1.
- Pre-Trip alarms are received on all 4 PPS channels for the following:
  - DNBR
  - LPD
  - Linear Power
- Turbine load is lowering slightly.
- Tcold is 4 degrees below program and trending down.
- Power is 104% and trending up slowly.

Which ONE (1) of the following is occurring, and which action is currently required to lower reactor power?

- A. Inadvertent RCS dilution; lower turbine load in accordance with the annunciator response procedures.
- B. Inadvertent RCS dilution; insert CEAs in accordance with SO23-5-1.7, Power Operations.
- C. ESDE; lower turbine load in accordance with the annunciator response procedures.
- D. ESDE; insert CEAs in accordance with SO23-5-1.7, Power Operations.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 082**

The following conditions exist:

- Unit 2 is at 65 % power.
- CEA #20 was dropped.
- Recovery is in progress.
- Group 6 is at 149 inches withdrawn.
- CEA # 20 (a Group 6 CEA) is at 100 inches withdrawn.
- CEA # 1 (a Group 2 CEA) drops into the core, indicating 6 inches withdrawn.

Which ONE (1) of the following describes the impact of this condition and the correct required action(s)?

- A. Power peaking limits may be exceeded if the conditions are allowed to continue. Continue realigning CEA # 20, then align CEA # 1 with their respective groups in accordance with SO23-13-13, Misaligned or Immovable Control Element Assembly.
- B. Shutdown Margin requirements CANNOT be met in this condition. Realign CEA # 1, then continue aligning CEA # 20 with their respective groups in accordance with SO23-13-13, Misaligned or Immovable Control Element Assembly.
- C. Power peaking limits may be exceeded if the conditions are allowed to continue. Manually trip the reactor and enter SO23-12-1, Standard Post Trip Actions.
- D. Shutdown Margin requirements CANNOT be met in this condition. Initiate a rapid downpower in accordance with SO23-5-1.7, Power Operations.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 083**

Given the following:

- A Reactor trip has occurred.
- The crew is implementing SO23-12-2, Reactor Trip Recovery.
- RCS pressure is 2150 psia and stable.
- RCS temperature is 538°F and lowering.
- SG E089 NR level is 82% and rising.
- SG E088 NR level is 62% and rising.
- All other indications are normal.
- SG level setpoint has been lowered to 55% in both SGs.

Which ONE (1) of the following actions is required?

- A. Remain in SO23-12-2. Lower feed flow rate and steaming rate to stabilize RCS temperature.
- B. Trip RCPs due to loss of NPSH in accordance with SO23-12-2, and enter SO23-12-7, Loss of Off-Site Power/Loss of Forced Circulation.
- C. Exit SO23-12-2, rediagnose the event, and enter SO23-12-4, Steam Generator Tube Rupture.
- D. Exit SO23-12-2 and go to SO23-12-9 based on RCS Pressure Control Safety Function not being met.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 084**

Given the following:

- Unit 2 was tripped 30 minutes ago.
- The crew is performing actions of SO23-12-3, Loss of Coolant Accident.
- RCS temperature is 525°F.
- RCS pressure is 1050 psia.
- Power has been lost to the entire switchyard.
- 1E power is being supplied by the diesel generators.
- Voids have formed in the head.

Which ONE (1) of the following actions will be performed to promote cooling of the reactor vessel head thus assisting with void elimination?

- A. Raising then lowering RCS pressure and pressurizer level in accordance with FS-10, Eliminate Voids.
- B. Venting the pressurizer in accordance with SO23-12-11, Attachment 15, Void Compensation.
- C. Starting a reactor coolant pump in accordance with FS-10, Eliminate Voids.
- D. Starting a CEDM Cooling Fan in accordance with SO23-12-11, Attachment 15, Void Compensation.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 085**

Given the following:

- SO23-12-9 "Functional Recovery" is being implemented.
- Heat Removal has failed HR-1.
- The STA reports Vital Auxiliaries no longer meets any success path.

Which ONE (1) of the following mitigating steps will be performed by the CRS FIRST?

- A. Implement FR-2, RECOVERY – VITAL AUXILIARIES.
- B. Implement FR-5, RECOVERY – HEAT REMOVAL.
- C. Reevaluate the event in accordance with Attachment SF-1, RECOVERY DIAGNOSTIC.
- D. Implement Success Path HR-2, ECCS + SG.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 086**

The following annunciators are received in the control room:

- 56C24, RCP P001 SEAL PRESS HI/LO
- 56B57, RCP BLEEDOFF FLOW HI/LO

The CO determines the following for RCP P001:

- Middle seal cavity pressure = 2238 psia
- Upper seal cavity pressure = 2150 psia
- Vapor seal cavity pressure = 2080 psia

Which ONE (1) of the following describes the action required?

- A. Trip the reactor and enter SO23-12-1, SPTAs. Stop RCP P001 after the reactor is tripped and CEAs have been inserted for 5 seconds.
- B. Isolate Seal Bleedoff to establish a boundary for the RCP seal and initiate an Engineering evaluation for continued operation of the RCP in accordance with AOI SO23-13-6, Reactor Coolant Pump Seal Failure.
- C. Initiate a Plant Shutdown to Hot Standby in accordance with SO23-5-1.4, Plant Shutdown to Hot Standby. Stop RCP P001 after the reactor is tripped and CEAs have been inserted for 5 seconds.
- D. Initiate a Rapid Shutdown to Hot Standby in accordance with SO23-5-1.7, Power Operations. Stop RCP P001 after the reactor is tripped and CEAs have been inserted for 5 seconds.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 087**

Given the following conditions:

- An EFAS actuation has occurred.
- SG E-089 Level = 15% NR.
- SG E-089 Pressure = 570 psia and lowering.
- SG E-088 Level = 20% NR.
- SG E-088 Pressure = 710 psia and lowering.
- NO action has been taken by the crew.

Which ONE (1) of the following describes the automatic operation of the EFAS System and actions that will be required to mitigate the event in progress?

- A. AFW is feeding SG E-089 ONLY. Override and initiate AFW flow to SG E-088 in accordance with SO23-12-2, Reactor Trip Recovery
- B. AFW is feeding SG E-088 ONLY. Override and initiate AFW flow to SG E-089 in accordance with SO23-12-2, Reactor Trip Recovery.
- C. AFW is feeding SG E-089 ONLY. Event mitigation will be in accordance with Floating Step 30, Establish Stable RCS Temperature During ESDE.
- D. AFW is feeding SG E-088 ONLY. Event mitigation will be in accordance with Floating Step 30, Establish Stable RCS Temperature During ESDE.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 088**

Given the following conditions:

- A reactor trip has occurred on Unit 3.
- Bus 3A06 has an overcurrent lockout.
- RCS pressure is 1200 psia and lowering.
- Containment Pressure is 16 psig and rising.
- Containment radiation levels are rising.
- All required ESF actuation signals have initiated.
- Containment Spray flow is 0 GPM on each Train.
- The crew is performing the SPTA diagnostic action.

Which ONE (1) of the following describes the event diagnosis and action required upon transition from SO23 12-1, SPTAs?

- A. Go to SO23-12-9, Functional Recovery, due to Containment Isolation Safety Function not being met.
- B. Go to SO23-12-9, Functional Recovery, due to Containment Temperature and Pressure Control not being met.
- C. Diagnose LOCA, enter SO23-12-3, and transition to SO23-12-9 upon recognition of Containment Isolation SFSC criteria not being met.
- D. Diagnose LOCA, enter SO23-12-3, and transition to SO23-12-9 upon recognition of Containment Temperature and Pressure Control SFSC criteria not being met.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 089**

Given the following conditions:

- Unit 2 is in a Station Blackout.
- Off-Site power is NOT available.
- BOTH EDGs have failed.
- 3A04 and 3A06 are energized by their EDGs.

Which ONE (1) of the following describes the action that may be performed based on these conditions?

- A. 2A04 and 2A06 may be supplied from Unit 3 DGs in accordance with SO23-12-11, Attachment 24, Supplying 1E 4KV Bus with Opposite Unit Diesel. No additional approval is required
- B. 2A04 and 2A06 may be supplied from Unit 3 DGs in accordance with SO23-12-11, Attachment 24, Supplying 1E 4KV Bus with Opposite Unit Diesel. 10CFR50.54(x) must be invoked to perform this action.
- C. 2A04 and 2A06 may NOT be supplied from Unit 3 DGs for this condition. Consider energizing 480 volt busses by performing SO23-12-11, Attachment 23, Cross-Connecting Class 1E 480 volt busses between Units. No additional approval is required.
- D. 2A04 and 2A06 may NOT be supplied from Unit 3 DGs for this condition. Consider energizing 480 volt busses by performing SO23-12-11, Attachment 23, Cross-Connecting Class 1E 480 volt busses between Units. 10CFR50.54(x) must be invoked to perform this action.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 090**

Given the following conditions:

- A Station Blackout has occurred on Unit 3.
- The crew is performing actions of SO23-12-8, Station Blackout.

Which ONE (1) of the following describes the priority for Non-Vital Bus energization, the reason why, and the action required for restoration?

- A. A08 is given priority; It supplies power directly to the MCC that supplies DC Bus D5 Battery Charger. Bus D5 supplies control power to align Non-Vital buses; A08 will be energized IAW SO23-12-11, Attachment 8, Restoration of Off-Site Power.
- B. A07 is given priority; it supplies power directly to the MCC that supplies DC Bus D6 Battery Charger. Bus D6 supplies control power to align Non-Vital buses; A07 will be energized IAW SO23-12-11, Attachment 8, Restoration of Off-Site Power.
- C. A08 is given priority; It supplies power directly to the MCC that supplies DC Bus D5 Battery Charger. Bus D5 supplies control power to align Non-Vital buses; A08 will be energized IAW SO23-6-2, Transferring of 4KV Buses.
- D. A07 is given priority; It supplies power directly to the MCC that supplies DC Bus D6 Battery Charger. Bus D6 supplies control power to align Non-Vital buses; A07 will be energized IAW SO23-6-2, Transferring of 4KV Buses.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 091**

Given the following plant conditions:

- A Turbine Governor Valve has failed closed.
- The RO is inserting Regulating Group 6 CEAs to restore Tcold to the programmed band.
- Reg Group 6 is at 126 inches.
- It has been determined that a Group 6 CEA is stuck at 144 inches.

Which ONE (1) of the following actions is required?

- A reactor trip should have occurred. Trip the reactor; enter SO23-12-1, Standard Post Trip Actions.
- A reactor trip may occur if the condition is allowed to remain. Continue inserting Reg Group 6 CEAs until Tcold is on program. Enter SO23-13-13, determine if the stuck CEA is trippable, and verify Shutdown Margin within 1 hour.
- A reactor trip may occur if the condition is allowed to remain. Enter SO23-13-13, Misaligned or Immovable Control Element Assembly, and align CEAs or verify Shutdown Margin within 1 hour.
- A reactor trip should have occurred. Trip the reactor, enter SO23-12-1, and initiate Emergency Boration of the RCS per SO23-13-11 for the stuck CEA.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 092**

Given the following:

- A plant startup is in progress.
- The unit is in MODE 3.
- Both CEACs are declared INOPERABLE.

Which ONE (1) of the following describes the action required in accordance with Technical Specifications?

- A. Suspend the startup and remain in MODE 3.
- B. Within 1 hour, verify that Shutdown Margin requirements are met. Startup may continue.
- C. Place the CEAC INOP flags in each CPC. Startup may continue.
- D. Enter and comply with the actions of TS LCO 3.0.3.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 093**

Given the following plant conditions:

- Unit 3 is initially operating at 95% power.
- Condensate Pumps P-050, P-051 and P-052 are initially running.
- Condensate Pump P-050 trips.
- Condensate Pump P-053 trips upon starting.
- NO action has been taken by the crew.

Which ONE (1) of the following describes the effect on the plant, and the action required?

- A. Main Feedwater Pump suction pressure will be maintained by 2 Heater Drain Pumps; determine the cause of the Condensate Pumps tripping in accordance with the applicable Annunciator Response Procedures.
- B. Main Feed Pump recirculation valves will throttle closed to raise suction pressure; enter SO23-13-24, Feedwater Control System Malfunctions, to verify the proper operation of the Feedwater System.
- C. Main Feed Pump recirculation valves will throttle closed to raise suction pressure; enter SO23-13-24, Feedwater Control System Malfunctions, to reduce load to within the capacity of the remaining Condensate Pumps.
- D. Main Feedwater Pumps will trip on low suction pressure; Trip the reactor and enter SO23-12-1, SPTAs.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 094**

Given the following conditions:

- Unit 3 is in MODE 1. All systems are operating normally.
- The time is 1200 on September 30.
- LCO 3.0.3 has just been entered due to a common mode failure affecting both trains of SIAS.

Which ONE (1) of the times below is the LATEST time that the plant must be placed in MODE 4?

- A. 1800, September 30
- B. 1900, September 30
- C. 0000, October 1
- D. 0100, October 1

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 095**

Given the following:

- Unit 2 is in MODE 1.
- The shift is manned to the minimum composition per Appendix R.
- The shift has 4 hours remaining.
- The 21 Watch has become ill and must leave the site for emergency medical treatment.

Which ONE (1) of the following describes the requirements regarding the shift composition and required action in this situation?

- A. Responsibilities of the 21 Watch may be turned over to the 22 Watch for the remainder of the shift.
- B. The 21 Watch may NOT leave the site until minimum manning has been maintained by calling in a qualified relief.
- C. The 21 Watch may leave the site immediately after turnover of responsibilities to another qualified person on shift. A replacement must arrive within 2 hours.
- D. The CRS may assume the responsibilities of the 21 Watch. The Shift Manager may perform duties of CRS and SM concurrently until normal shift relief, as long as a qualified STA is on site.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 096**

A Procedure Change is being initiated.

It has been determined that the change will result in procedure performance NOT in accordance with the UFSAR.

A 10CFR50.59 screening determined that a 10CFR50.59 evaluation is required.

Which ONE (1) of the following describes the MINIMUM approval authority required to perform the Procedure Change?

- A. Satisfactory completion of a 10CFR50.59 evaluation AND NRC approval prior to implementation.
- B. Satisfactory completion of a 10CFR50.59 evaluation prior to implementation only.
- C. Two SROs must review and approve the procedure change prior to implementation. A 10CFR50.59 evaluation must be performed within 24 hours.
- D. The Operations Manager must approve the procedure change, and a 10CFR50.59 evaluation must be performed within 24 hours.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 097**

Given the following conditions:

- A Gaseous Waste release is planned for Unit 2.
- Wind direction is from the ocean.

Which ONE (1) of the following describes the status of the planned release in accordance with SO23-8-15, Gaseous Effluent Release?

The release...

- A. CANNOT be initiated until wind direction changes.
- B. may be initiated **ONLY IF** wind speed is below minimum required by a calculation.
- C. may be initiated **ONLY IF** wind speed is above the minimum required by a calculation.
- D. is DESIRABLE and may commence without restriction.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 098**

Given the following conditions:

- Radwaste Secondary Tank T-057 is being released to the Unit 2 outfall.
- Liquid Radwaste Effluent Line Radiation Monitor, RE7813, indication becomes erratic, and then fails LOW.

Which ONE (1) of the following describes the actions required?

- A. Ensure the radwaste release is stopped. RE7813 must be declared OPERABLE prior to reinitiating the release.
- B. The release may continue as long as no High Radiation alarm was present prior to the radiation monitor failure, and the release permit calculations are still valid.
- C. Ensure the radwaste release is stopped. Two independent samples must be analyzed. Two technically qualified members of the facility staff must independently verify the release rate calculations and discharge line valving prior to reinitiating the release.
- D. The release may continue as long as dilution flow rate has not changed. Two independent samples must be analyzed. Two technically qualified members of the facility staff must independently verify the release rate calculations and discharge line valving within 4 hours.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 099**

Which ONE (1) of the following events requires a 1 Hour report to the NRC in accordance with 10CFR50.72?

- A. Initiation of a plant shutdown in accordance with Tech Spec 3.0.3.
- B. Initiation of a Licensee Event Report (LER).
- C. Confirmed violation of Fitness for Duty requirements.
- D. Declaration of an Unusual Event.

U.S.N.R.C. Site-Specific Written Examination  
San Onofre  
Senior Reactor Operator

**Question 100**

Given the following conditions:

- Unit 3 is at 100% power.
- A loss of all Control Room Annunciators occurs.
- The crew has entered AOI SO23-13-22, Loss of Control Room Annunciators.
- The Shift Manager is determining potential event classification.

Which ONE (1) of the following additional actions is required within the first 15 minutes?

- A. Terminate activities that could disrupt plant stability in accordance with AOI SO23-13-22.
- B. Call out additional operators to intensify plant monitoring and assign additional compensatory actions (ACAs) in accordance with SO23-13-22.
- C. Initiate a power reduction to a lower stable power in accordance with SO23-5-1.7, Power Operations.
- D. Shut down the plant to MODE 3 in a steady controlled manner in accordance with SO23-5-1.4, Plant Shutdown to Hot Standby.